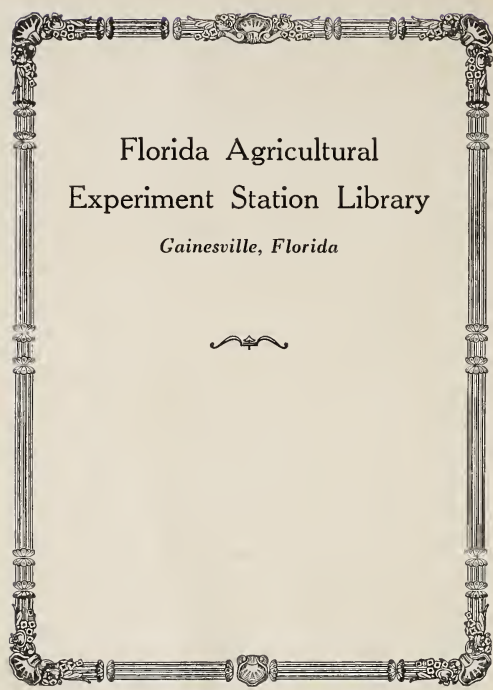


NEW TECHNIQUES
FOR
SUPERVISORS
AND FOREMEN

ALBERT WALTON

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**THE NEW TECHNIQUES
FOR
SUPERVISORS AND FOREMEN**

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The New Techniques *for* Supervisors and Foremen

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THE NEW TECHNIQUES FOR SUPERVISORS AND FOREMEN

CHAPTER 1 INTRODUCTORY

What I want to say in these opening sentences would normally be put in the form of a preface, but few people read prefaces and I want this part read. To begin with, this book is not going to provide you with a miracle-working formula. It is not going to show you how to "have, be, and do whatever you may desire." It is not going to instruct you in the mysticism of the Orient to the end that you may gain a dominant influence over others.

The situation is just this. For twenty-five years after I was graduated by Cornell University as a mechanical engineer I was actively engaged in the field of industrial engineering, part of the time with such organizations as Westinghouse and General Electric, part of the time with public utilities, and part of the time as a consulting industrial engineer with my own office and private practice. I mention this merely to indicate that my experience has been more in the practical field than in the academic. I recall the story of the owner of the Mississippi River steamer who put an advertisement in the St. Louis paper for a pilot and had but two replies, one an exceptionally bright young man in his twenties, the other a dour old riverman in his late fifties. The owner explained the value of his ship and the importance to him of having a capable pilot to guide it. He asked the young man if he knew the river thoroughly and he replied that he had been to the Pilot's School and could point out on the map the

location of every shoal, snag, bar, and crag between St. Paul and New Orleans, and could draw in on the map the exact location of the entire channel between the two cities. The owner was much impressed and turned to the older man and asked whether he thought he had as good a knowledge of the danger spots in the river as this young man had. "Well," he said, "I reckon so—I've hit 'em all." Knowledge of the map is exceedingly valuable. Some of it is not appreciated to its fullest extent until it has been reinforced by the experience of actual contact. The combination of map knowledge and knowledge gained by practice is what is most serviceable to ourselves and to others.

Not only have I hit a good many of the problems which the industrial man has to face every day, I have had to make adjustment to many of a personal sort, which, while they were not pleasant experiences at the time, did give me an incentive to investigate the field of modern psychology to see whether, perhaps, there might not be found in it at least a hint of a remedy for my difficulties. From a casual browsing in the field I came to look upon it seriously in two ways: first as a way out from my distress, and second, as an opening to a new career in which age would be no barrier but rather an advantage. I was urged to this latter view by the fact that I was then on the Pacific coast, where my industrial-engineering experience had little value, out of a job and over forty-five years of age, which I found put me outside the pale of desirable applicants for such openings as I was able to search out.

The rest was simple routine accomplishment. I registered at the University of Washington in Seattle and took all the courses they gave there in undergraduate psychology and then went on through to take my master's degree there in the same subject, teaching and lecturing as one of the staff meantime to help defray expenses. From there I went to Stanford University where I taught classes in psychology while securing the instruction necessary for my

doctor's degree, after which I was taken on as a regular member of the faculty there with the rank of instructor in psychology. I was still engaged in this work when, three years later, I received a wire from the Pennsylvania State College offering me an assistant professorship and my present job of teaching industrial psychology in their foreman training classes in the various industrial plants around Philadelphia and the territory within a hundred miles of the city.

The point of all this is not so much that I found a way out of my difficulties through a study of modern psychology, but that I came into the field of psychology after a quarter of a century in the active world of industry looking for something usable, something that I could apply to my own situation. The field is tremendous. Every college has its laboratory and its specialty. The researchers run into the thousands. The American Psychological Association alone has 1500 members and each of them has published at least one report on the results of his research and some of them fifty or a hundred or more books and articles. Naturally in such a volume of contribution there was much that, while of value as a contribution to science and to the general knowledge of mankind concerning himself, was of little practical use to me and would be of as little use to you. It therefore became my chief interest to ferret out from this vast mass of factual material just those things which should be of assistance to the perplexed but ambitious supervisor in a modern industrial plant. It is this material that I have attempted to work up into readable form in the chapters that follow.

I am assuming that the reader has as little background in modern psychology as I had when I left the one-room cabin among the redwoods of California. I shall not use technical academic terms, nor shall I propound any startling theories; but what I say will be based on what I have gathered from the researches of men who have spent a lifetime in the work and who have maintained throughout the

same scientific attitude that is held by the physicist, the geologist, or the chemist. My task is merely that of the interpreter, not at all that of the original investigator and discoverer. In other words, I aim to make this, like the Constitution of the United States, a "laymen's document," written not by a psychologist but by a layman for laymen. Like Mark Twain's countryman who, when he had the word "prose" defined for him, was surprised and pleased to find that he had been talking prose all his life without knowing it, so you may find that you have been using the principles of modern scientific psychology ever since you began to have business relations with your fellow men. In this we hope you will persevere. The most that we can hope for here is that we may help you to understand better than ever why the methods you have used have been as successful as they have been. It is possible that you may also discover that you have been violating some of the psychological laws and have wondered why the results have not been as you might have expected them to be. In such a case you will have been helped to a better understanding and so to the adoption of better methods, and our aim in writing the book will have been accomplished.

That is really all that belongs in this prefatory chapter, but experience with my foreman classes prompts me to introduce at this point one factor that I used to include in the final lesson of the series. It has to do with the matter of correct methods of reading, and one of my students pointed out that the place to tell them how to read properly was before they began to read my text, not after they had got all through with it. When I was at Stanford, the administration office of the university called up the psychology department and said that they had just discovered that about half of the students "on probation" because of poor academic work in their classes appeared to be in difficulties primarily because they were poor readers and asked if there was not something the psychologist could do about it. Since I was at the bottom of the ladder, the

“freshman” of the department, I had the job turned over to me and spent many months devising apparatus to photograph the eye movements of the readers and to speed up their reading after the photographs had been analyzed. The outgrowth of it has been a series of classes throughout the academic year under an instructor whose sole task is to teach the college student how to read. And the amazing thing is not merely that freshman could have gone all through grammar school and high school with improper reading habits, but that juniors and seniors, and even graduate students, schoolteachers, and principals also needed the instruction fully as much. Now, we cannot photograph your eyes as you read, and we cannot provide you with apparatus for increasing your reading rate, but we can suggest to you a way to find out for yourself whether or not you really know how to read. You may be surprised by the results. We were when we tried it on ourselves. Close this book right now and try to repeat all the facts of the last sentence, without rereading it, the sentence which begins “Now, we cannot photograph your eyes.”

Read it again. Did you get all the essentials?

Now see how much of the entire paragraph you can recall. The paragraph begins “That is really all that belongs in this prefatory chapter, but. . . .”

The chances are good that you cannot repeat the real gist of a quarter of it. You will not be exceptional if you cannot repeat more than 10 per cent of it. I do not mean repeat the words as they are written. I mean tell in your own words all that was talked about in the paragraph. If you cannot repeat the meaning of what you have *just* read, what chance is there that anything you read an hour ago, yesterday, last week, is still with you? If this is so, what is the use of reading? You are just wasting your time and tiring your eyes for nothing. Yet that is the way most of us read. Fortunately, we find that it is just a bad habit. It is not a defect of intelligence or a lack of capacity.

Nobody ever taught any other method to us. We have been reading books and magazines and newspapers all our lives without assimilating 1 per cent of what we read, without making one part in a hundred our own, a part of ourselves, an addition to our store of knowledge.

You may reply in defense that most of what we read is not worth remembering. Probably so, but that is an argument for cutting that sort of reading material off our list rather than an argument for continuing to read in such a slipshod manner that we cannot remember what we read when we do find something worth while. You have need and use for all the knowledge you can acquire in this world. Perhaps you have made an honest attempt at one time or another to gain some of this knowledge by reading and have given it up because you found you had such a "poor memory" that none of the material stuck with you. Your memory is all right. You remember plenty of other things, telephone numbers, batting averages, cocktail recipes, popular songs, employee's names and failings. The trouble is you have never learned to read with the *intent* to find out what is in the paragraph and to make it yours.

Try it. Open this book at random about in the middle. Select a sentence of about four lines and read it once. Immediately close the book and say to yourself "What did the writer say?" Do not try to repeat the words as they were written. Use your own words, but make them definite. Do not just say, "Oh, he was talking about fatigue." Why did the author write the sentence about fatigue? What did he say about it? How many and what sort of things did he say about it, and what else did he talk about, if anything, and what did he say about that? And then open the book and read the sentence again and see if you missed anything. You probably did, but never mind. Read another sentence, and see what luck you have. In fact, don't read any other way from now on for the next month, not even when you are reading an account of a World's Series ball game. Read this book that way

from now on. Read a sentence and see if you can recite the meat of it. You will find that one sentence at a time is enough to start with. What you are doing is building a new habit. As it grows in power, you can afford to take on two sentences, but not until you have found it easy to digest one at a time. In a surprisingly short time, after say an hour or two of one sentence at a time, you will be able to take on two, and then three, and finally a whole paragraph, and you will find that you are able to give back every item that the paragraph contains. This degree of proficiency may not come by the time you have finished this one book. If not, go ahead on another. One thing is certain. You will remember more of the book you read that way than of any book of equal length you ever read before.

I have told many people to do this and they always come back with the complaint that it takes so much time. They do not get much read in an evening. That always amuses me. Which is better—to read one page and *get* it, or read twenty pages and get nothing? They say they do not have time to read that way. The truth of the matter is they do not have time to waste reading the old way. It appears to take time at first, but in the long run it is the greatest time saver a busy person can cultivate. Once the habit of *reading for meaning*, reading to make the material yours, to get the sense of it, becomes fixed, you will find it is automatic. You cannot read any other way from then on. Knowledge and information begin to accumulate and accumulate in usable form so that you can call on them when you want them. If you get this habit as a result of this suggestion, you will have secured your money's worth from the book whether you get anything else from it or not. Begin to form the habit with the next chapter.

CHAPTER 2

WHAT DO WE MEAN—PSYCHOLOGY?

Ask the first man you meet what the word "psychology" means, and the chances are ten to one he will tell you psychology is the study of the mind. *Psyche* is the old Greek word for mind, or soul, it is true. But ask this man what he means by "mind," and he begins to hesitate. We use a great many words that have a vague sort of meaning for us but that we cannot define exactly. The commonest reply will be, "Well, the mind is what you think with." "Think?" What does that mean? What do you do when you think? And here he is usually at a loss for any sort of an answer. So psychology is the study of the mind, which is what we think with, and we cannot say what either the mind or thinking is unless we say that the mind is what we think with and thinking is what we do with the mind.

And then suppose we ask the man where his mind is. If we are going to study it, we ought to be able to locate it. Usually he will tell you that the brain is the seat of the mind. He now has a new idea and says we think with the brain. He does not say that the mind and the brain are one and the same, but we think with the brain and we think with the mind, so probably the mind is in the brain.

Maybe the man is right. Certainly no one can say he is wrong. No one that we know of has ever seen a mind. Whenever a mind comes into our laboratories, there always seems to be a body with it. Sometimes we may be inclined to think that some of the bodies that come before us have no minds connected with them but so far the reverse has never occurred. Just as "where there's smoke, there's fire," so where there's a mind, there's a body. Someday

somebody may bring in a disembodied mind for examination, but no one has done it yet.

But, he says, the seat of the mind is in the brain. Let's have a look at the brain and see if we can learn something there. We psychologists have to depend on the neurologists, the anatomists, the physiologists for our information here, although many modern psychologists are now also well skilled in these other fields on their own account. In any event, we learn that the brain is merely a bunch of nerve fibers, no different in their essentials from any of the other nerve fibers in the body. They tell us that the brain has about twelve million of these fibers. I never counted them, nor did anyone else, but they have counted small areas and made their estimates of the total from that. The brain is white on the inside and gray on the outside. The gray part is like a bark about three-sixteenths of an inch thick. It is gray because here the nerve is uninsulated at its ends, where it branches out like the roots of a plant. It is uninsulated in order that the nerve impulse can pass from one fiber to another, whereas when the fiber passes down into the brain on its way to some other section, it is insulated with a white sheath. Thus, the nerve impulse, which is an electrochemical impulse, can pass from one fiber to another only in the gray matter of the bark where proper contacts can be made. Otherwise any nerve impulse would merely diffuse throughout the brain mass. The white insulation prevents this and ensures transference in regular pathways.

Thus, the brain is really merely a marvelous switchboard or a kind of telephone exchange. The arrangement of the gray endings is such that though in normal operation each section has its definite business to take care of, any section can be connected to any other section. There are more possible connections in the human brain than in the whole intricate network of the entire American telephone system. In the office in downtown Philadelphia, anyone can manipulate a dial on the telephone instrument to a series of letters

and numbers found in the phone book, say GRE2767. In the downtown central station an arm automatically plugs in the GREenwood central exchange, and there another set of contacts selects automatically the second bank, the seventh stack in the bank, the sixth row in the stack, and the seventh hole in the row and plugs in on the correct phone. The two centrals are very necessary for the call, but the call neither originates nor stops at either central. So with the brain. So far as we know, no nerve impulses either originate or stop in the brain. I am driving my car along the boulevard when the rays from a red light enter my eye where they start a nerve impulse that passes directly to the back part of the brain. There the impulse connects with another fiber and passes to the fore part of the brain where another connection is made to the leg-muscle nerve fiber and I shift my foot over to the brake. Or I see the ball leave the pitcher's hand and the impulse travels to my batting arms and I either hit the ball or miss it, according to whether I am a DiMaggio or a rookie. Or someone steps on my toe in a crowded streetcar. The nerve impulse goes up the fiber that runs up my leg, through some relays to the brain, through the proper switching pathways to my speech mechanism, and I ask him whether, if it is all the same to him, he would mind stepping on his own feet.

The man who says the mind is in the brain may agree that in these cases the brain is merely a switchboard, but, he says, how about solving puzzles or some such action which really involves thinking? Let's test it out. Can you solve a puzzle without calling on muscles directly or indirectly? Suppose I ask you at what place on the earth the wind always blows from the north, if it blows at all? You start "thinking." Broadway runs north and south, but the wind might blow from the south there. Some place in Canada maybe; but there the wind might blow east or west. Finally, you decide that the only place where every wind must come from the north is at the South Pole. While you have been thinking, we have been observing you

with electrical devices and mechanical gadgets, and we find that you have been sending nerve impulses to your tongue, your throat, your palate, and all the other portions of your speech mechanisms. You have been making words, though only in rudimentary form. Maybe you have also been seeing pictures of Broadway and the Canadian Rockies and Little America at the South Pole. If so, we find you have been sending impulses to your eyes. Furthermore, we find that if you send no impulses, you do no thinking. You cannot multiply thirteen by seven "mentally" if you do not have tensions in some of your muscles. Attention to anything involves muscle tension somewhere in the body. If there are no muscle tensions, you not only cannot think, you cannot even stay awake.

Here, then, we have two facts. Whenever you "think," you have nerve and muscle activity in various parts of the body. If there is no such activity, there is no thinking. What then becomes of the "mind"? Frankly, we do not know. We know nothing of any mind that works without a body. We prefer to say that we probably think with the whole body, or many parts of it at once, rather than with the brain, which seems to be merely a necessary inter-connecting central station to hitch all parts of the thinking mechanism—the body—together. There may be a "mind" independent of the body but, even if there is, it appears to be able to operate only by using the physical mechanism. So why worry about it? The only way we know anything about the mind is by what the body does, whatever the cause may be. We cannot measure the unseen, unknown, intangible, "mind." We *can* measure what the body *does*. Hence, modern psychology prefers to say it is the study of human behavior and to leave the troublesome problem of the "mind" to philosophers or parsons or radio psychologists. We prefer not to use terms the meaning of which we do not know, and very evidently we do not know the meaning of the word "mind." We do know what behavior is, and we can measure it.

Most psychologists insist that psychology is a science. I am not sure that such an assertion is justified. Certainly we can say they use scientific methods in obtaining their information. If medicine is a science, psychology is. In fact, it is much more scientific in its procedure than medicine is. Neither one is an exact science like physics or chemistry, and for very good reasons. In chemistry an atom of sodium is an atom of sodium wherever you find it, and if you combine it with an atom of chlorine, any atom of chlorine, you will get table salt. In physics water under 14.7 pounds of atmospheric pressure will turn to steam if you heat it to 212 degrees Fahrenheit, whether the experiment is performed in New York or in San Francisco and whether it is done in 1839 or 1939. But the materials that psychology deals with are never twice the same. No two people are ever exactly alike, and no one person is ever exactly the same one moment as he was a moment before or will be a moment later.

Formerly psychologists were merely keen observers, philosophers, who noticed that their friends and acquaintances usually could be counted on to behave in certain ways and then tried to explain why they behaved that way. They studied their own reactions and tried to find explanations that would account for the way they behaved in various situations. Since each psychologist was observing a different person, there was not much agreement between them. In one thing, however, they did agree very nicely. If they could not find a satisfactory reason for any particular kind of human behavior, they explained it by saying it is an instinct. People gather in cities because of the "herd instinct." People quarrel and fight because of an "instinct of pugnacity." People get rich because of an "instinct of acquisition." Some psychologists found as many as thirty instincts. No matter how anyone behaved there was an instinct to account for it. All of this was very convenient, but it was hardly an explanation. It was

merely a filing system, a division of behavior into classes. Naming things is not all there is to explaining them.

It was not until about 1880 that anyone had the bright idea that people could be studied in a laboratory under laboratory conditions. In the laboratory the surrounding conditions can be fairly well controlled and kept constant during the experiment. Distracting sounds, sights, and smells which might affect a person's reaction can be kept at a minimum or eliminated altogether. If everything in the laboratory remains the same throughout the experiment except one item, and if then the person reacts in a certain way when this one item is changed, and if he reacts this way only when the item is changed and at no other time, we may begin to suspect that his behavior is in answer to the change. This is the beginning of scientific method.

But even this is not enough. A professor at Harvard might thus examine Lowell Sebastian Cabot for a month and find that he always reacted the same way under the conditions set up, but a professor in Minneapolis in repeating the experiment with Ole Hanson might get entirely different results. The modern psychologist does not attempt to generalize from one or two cases. He extends his field of investigation to cover five hundred or a thousand—in some cases tens of thousands—and even then he does not make sweeping statements. All he will say is that if the experiment is repeated under the same conditions, we may expect to get the same results so many times in a thousand. For example, he will say, perhaps, that we may expect the same results in 910 out of 1000 cases, and even this he will qualify by adding "plus or minus" something, say plus or minus 10. By that he means that in 1000 repetitions we may expect the same results from 900 to 920 times. Nothing in psychology is 100 per cent. Everything is stated statistically, and since it is so stated, we know just how reliable our findings are. In the early days the statements were made with a misleading finality,

and one had to take them or leave them as wholes. Today, a psychologist must be also a statistician and be able to calculate the "probable errors" of his findings, their reliability and their significance, and these items must be included in the reports of his experiments.

But even this is not enough for the modern psychologist. We have said that he brings his individual into the laboratory and measures the change that takes place when some one item of the environment is changed. That used to be thought conclusive evidence that the behavior was the result of the change. Maybe not. The fact that an event happens after another event is not proof that one is the effect of the other. A hundred years ago the average length of life was about forty years. Now it is around sixty. A hundred years ago no one smoked cigarettes. Now almost everyone does. Does that justify our saying that smoking cigarettes has increased the span of life? The psychologist in his laboratory must demonstrate also that if the one condition is not changed, the change of behavior does not take place. Otherwise, for all he knows, the change in behavior might be due purely to the lapse of time and might have occurred even if he had not introduced his experimental change in the environment.

So he always has to have what he calls a "control" group. To make sure that coffee speeds up mental and physical reactions about 3 per cent, he has to test his group before they have coffee to find out their normal rate, then after drinking coffee, to see how much they speed up. But then he has to make sure it is the coffee and not something else. It might be just any warm drink, or it might be just because the individual has the idea that coffee stimulates. So he calls on a control group, and to these he gives coffee with the caffeine removed. It is a warm drink, and it tastes like coffee. They think it is coffee. If now he finds the same amount of speeding up, he suspects that it is not the coffee. It may be the warmth or the suggestion. If, when the denatured coffee is used, he finds no speeding up

and does find it when real coffee is given, he is justified in concluding that the increase is a result of the coffee with its natural content of caffeine. To make assurance doubly sure, he will probably go further and administer doses of caffeine in capsules to some of his groups and distilled water in similar capsules to others. If the groups getting caffeine speed up and those getting water do not, he is assured that it is the caffeine in the real coffee that does it because he has eliminated the factors of warmth and of suggestion. Control groups are as necessary in modern psychology as are statistical treatment of results and careful control and measurement of conditions and reactions.

One result of this sort of scientific procedure has been the overthrowing of a great many beliefs and superstitions that have been held by mankind for centuries. Does a high forehead denote intelligence? Does a square jaw denote determination? Does the ability to look a man in the eye indicate honesty? Can one tell anything about a man's character from his handwriting? Is our destiny affected by the position of the stars at the time we were born? Is there a "criminal type"? Does one man have many accidents and another few because one has better luck than the other? Questions of this sort were formerly settled by reasoning them out, by argument, and by debate. Now the psychologists test them in the laboratories with controls, and they publish the results, and others check them with other controls and other methods. They measure the heights of the foreheads and find the ratio of the dimension to other dimensions of the face and head. Then they measure the intelligence by well-calibrated tests, and they compare the dimensions with the intelligence-test scores to see whether there is any "correlation." If most of the people with high foreheads test high in intelligence and most of the people with low foreheads test low in intelligence, the psychologists might conclude that the high forehead may be an indicator of high intelligence. Actually, they do not find this to be true. Some persons

with high foreheads are bright but so are some with low foreheads. The statistics show that if enough people are tested you might just as well estimate intelligence by throwing dice as by measuring foreheads.

In the days gone by the so-called "psychologists" used to speak learnedly of "faculties." One man had a large faculty for memory. Another had a faculty for observation. With this view of mankind, two old-timers went around looking for men with certain faculties highly developed. They found a scientist with large powers of observation and on his head they found a peculiar bump that most people do not have. The bump was evidently an indicator of the faculty of observation. It was a discovery! They went on and found a bump for every faculty, a bump for curiosity, one for caution, another for self-esteem, for firmness, and for a host of others. The whole "science" of phrenology—reading the character by observing the bumps on the head—was built up. It is still believed by millions of unscientific persons.

But the modern psychologist has demolished the whole structure of phrenology inside and out. He does not find the faculties to begin with. A man has no "faculty of observation." He has various *habits* of observation or of the lack of it. He may observe that you are driving a last year's Ford and exactly how the engine sounds when you start up and not observe what sort of a hat his wife wears. And even if he observes everything, there still is no one center in the brain concerned with his observations. What he observes through his ears goes to one portion of the brain, through the eyes to a totally different section, through the fingers to another. And even so, no amount of use of eyes, ears, or fingers in observation will increase his brain fibers in either number or size. Furthermore, even if there is a "bump" on the surface of the brain through which nerve impulses pass during observation, that does not mean that there will be a like bump on the skull. The contour of the outside of the head does not

follow that of the surface of the brain. Thus, on all the factors on which the so-called "science" was built, it falls down in the light of modern studies of anatomy and neurology.

But there is the off-chance that, even so, a bump might still be observable in a certain place whenever we find a person with certain abilities, whether we can explain its presence or not. So the modern psychologist puts the matter to test. He brings in 1000 people who have a high degree of development of some ability and another 1000 who have little or none of this ability. He measures the bump which the phrenologist connects with that trait and finds no relation whatever between the presence or absence of the bump and the presence or lack of the trait. Nor does he find a bump anywhere else that one possesses and the other does not. He concludes that the science of phrenology is without foundation in fact and lets it go at that.

The psychologist finds that we cannot even make a respectable guess as to a man's intelligence by looking at him. I have seen a group of thirty judges try to estimate the intelligence of a group of ten young men by looking at their photographs. They were just as likely to reverse the order as to get them right, placing the bright ones as stupid and the dullards as above average. I have seen them guess one nearly feeble-minded lad as next to the brightest of the group, and one near genius as feeble-minded. You might think you could do better with moving pictures, but it is not so. You can guess as well before you see the pictures as after.

"But," you say, "pictures, even moving pictures, are not alive. Let me talk to the man ten or fifteen minutes and I will tell you whether or not he is intelligent." Perhaps. You may be better in this than the hundreds of men we have put to the test who thought they had the ability to do this but who, when their judgments were scientifically checked up, were found to do little if any better

with the interview than they could do with the pictures. Perhaps the best example of this was an experiment conducted with a dozen trained personnel men who had for years been selecting men for jobs by the interview method. Personnel men as a class are not receptive to the notion that their judgments of applicants are not very reliable.

In this experiment twelve experienced personnel men were asked to rate fifty-seven applicants for a salesman's job as to their fitness to fill the position. This was no strange task for these twelve men. It was just what they were doing for a living. Each one felt competent and confident. In order to eliminate any influence of one man's procedure on the opinions of the others each was placed in a separate room where he had the opportunity to interview each of the fifty-seven applicants in turn according to his customary methods which each one from his experience has found to be effective. It was a regular commercial situation. The men were real applicants for a real job, and the one judged best was to be hired. Each of the twelve personnel men rated each of the applicants and placed him somewhere in a list, from first to fifty-seventh, graded according to the interviewer's opinion as to his desirability, or "hire-ability."

What was the result? Of course, inasmuch as the whole lot were not hired and, therefore, no subsequent record of sales was available to compare with the various ratings, we cannot say how accurate any given rating was. Maybe one of the twelve made a perfect rating. Maybe none did. This much we know, and it is enough to show that the system is largely a matter of the personality, not of the applicant, but of the interviewer. There were no two lists anywhere near the same. Any man found high on the list of one employment manager was low or medium on some other list. Not even taking a man's average position on any eleven lists would give any inkling of where he would be found on the twelfth. And it actually happened that applicant No. 3 was rated as the best man of the fifty-seven

by one interviewer and fifty-seventh, or worst of the lot, by another. Both could not have been right. The chances are a hundred to one both were wrong. Interviewing is not a satisfactory way of securing an estimate of a man's abilities. The only reason it has survived so long is that the interviewer never knows how unreliable his judgments are because he never knows anything about the men he has rejected. All he does is compare those he accepts with others who have previously been accepted, whether they are the best or the worst of those who have presented themselves. It remained for modern psychological methods to show conclusively the weakness of the system.

The psychologist of today says that these old-time methods are faulty because they are "subjective," and he makes a plea for the adoption of more "objective" techniques. To put it another way, he asks us to eliminate from our judgments all our own biases and prejudices. A subjective judgment is one that is influenced by the personality, the likes and dislikes, the emotional habits, the "personal equation" of the examiner or experimenter. There are certain kinds of people I do not like, because of my own past experience with people who look like them, smile like them, talk like them. Try as I may, I cannot wholly separate myself from my past. To the extent that I do not overcome these prejudices, my judgment is made unreliable. The very people I do not like, you or some other person may especially like—and for the very reasons I give for disliking them. Our past experiences have been different. It is difficult enough to make a correct estimate of a person's abilities when only that one personality is involved. When we add to the situation the complication of our own personality and the interplay of the two personalities, it becomes all but impossible.

Three things, then, are deemed essential in modern psychology: objective methods of observation and measurement, "control groups" for checkup, and statistical evaluation of the results.

An excellent example of the error into which an eminent man may fall if he neglects any one of these factors is afforded by the work of the famous Italian criminologist of the last century. Lombroso attempted to ascertain the significant features that may be associated with the trait of criminality. Using objective methods and as much statistical procedure as was available at that early date, he examined hundreds of criminals in the prisons and penitentiaries of Italy. He found that a large percentage of the criminals definitely displayed certain physical markings. He described the texture of the skin, the wiriness of the hair and its tendency to curl, the thickness of the eyebrows, the form of head, the thickness of the lips and many such factors. He advised the police of Italy, when a crime had been committed and the perpetrator was unknown and being sought, to look for men with these traits and markings and for twenty years or more his findings were the handbook of Italian criminologists. And it was found that when the criminal was rounded up, sure enough, he generally had the configuration that Lombroso had described.

But there was one thing he had neglected, he had not employed a "control group." He had not measured the same factors of noncriminals. When, finally, modern psychologists did this, they found that the population outside the prison walls had the same traits in the same percentages. There were just as many honest men with thick lips as there were criminals in proportion to the total numbers of both groups. What Lombroso had measured and described was not the criminal type; it was the Italian type. The population of the Italian jails is merely a representative cross section of the population of Italy, just as the population of the penal institutions of the United States is a cross section of the population of this country, as to physical, emotional, and intellectual factors.

But Lombroso's notion of a "criminal type" was accepted so generally and for so long that it is hard to eradicate. The general public still believes that there is such a thing.

If, when you see the picture of a man who is reported by the papers to have committed some especially horrible crime, you say, "He does not look like a criminal," you are showing that you think there is a way a criminal should look—that there is, in truth, a criminal type. Take ten pictures from the rogues' gallery, pictures of men around twenty-two or twenty-three, who have been convicted of a series of crimes ending in kidnaping and murder. Select ten college students of the same age and choose them for their general reputation for integrity and outstanding uprightness in the community and take them to the rogues' gallery and dress them in prison garb, give them a prison haircut, fasten the usual identifying numbers on their chests. Shuffle the twenty photographs together and ask anyone to pick out the ten criminals. Experience shows that it can be done as well with the eyes shut as it can by a careful analysis feature by feature or a general observation involving feeling or "intuition." There is no criminal type for the very good reason that criminality is merely something learned—a bad habit, if you will. But without the techniques of the use of control groups this might never have been established as a fact.

To summarize: What I wish you would get from this chapter is the habit of bringing under suspicion some of your own pet beliefs. Are they sound? Would they stand the test of objective measurement and observation? If they are things that enter into your judgment of other people or your own habits of life sufficiently to have a bearing on your success and happiness check up on them either by going to the works of the modern psychologists to see whether their findings back up your own beliefs or contradict them, or learn for yourself the methods these scientific men use. Rely more on objective methods so as to eliminate your own bias and prejudice. Learn to apply the system of using control groups; if you find that nine out of ten people holding to your kind of religion are honest, find out whether nine out of ten people holding other religions

are honest also before you account for the honesty as a result of the particular religion. And adopt at least part of the attitude of the statistician in evaluating your opinions and your observations. If you find nine out of ten Mohammedans are honest, it may be quite interesting and may suggest that the matter is worth looking into, but it does not prove anything. The next ten you put under observation may be wholly dishonest. But if you find 900 out of 1000 Mohammedans picked at random are honest, you are beginning to get interesting data that have some significance. The modern psychologist does not generalize from a single case or from a small number of cases, and even when he has examined a great many, he knows that although his results are much more significant, they are still subject to some slight error. Other things being equal, the broader his base, the firmer his structure; the more cases he examines, the greater his degree of accuracy.

CHAPTER 3

HUMAN HABITS

Here is a big ball 8000 miles in diameter turning over at the rate of sixteen miles a minute, surface speed, and swinging along around the sun at the rate of sixteen miles a second. It is surrounded by a thin layer of gases. It is made of somewhat more than ninety different elements in thousands of different combinations, solid, liquid, and gaseous. Riding around on this high-speed projectile are some peculiar organisms that are endowed with the power to use what they find here in such a way as to grow in size for a time, move about the surface a bit, reproduce their kind, and then disintegrate, leaving their offspring behind to go on through a similar cycle of growth, reproduction, and death. They are of all sorts, sizes, shapes, and behavior. Some seem to fit the conditions so well that though each individual lives but for a few round trips around the sun, or even for only a single spin of the ball itself, the descendants survive more or less indefinitely. Some types either do not fit the situation so well or cannot survive the changes that take place as the ball grows older. The mammoths and the dinosaurs faded out of the picture in this way. There seem to have been many experiments, some of which have been more successful than others.

Two of these experiments are now in progress side by side, competing for supremacy with two radically different methods, and no one can yet say surely which will be the more successful. One is a vast group of tiny little organisms so numerous that no man can pretend to guess how many billions of billions there are. Though generation succeeds generation endlessly, they never change either their appearance or their ways. They never learn new ways

of behaving. They do not have to. As soon as they are hatched they know as much as they are ever going to know and that is enough to meet their environment so well that there is no danger of their becoming extinct—or perhaps we might say, no hope of it. The ants of today behave exactly as they did when they got into the kitchens of the rulers of Egypt before the Great Pyramid was built, or 4000, or maybe 400,000 years before that. Although their community life is exceedingly complicated, it is always the same under the same conditions, their behavior automatic, invariable, but entirely adequate to meet the environment in which they live century after century. This is the perfection of instinct and it seems to work.

The other experiment is with an organism that can modify its behavior according to its environment and the changes that take place around it. If it cannot make suitable alterations in itself to fit the environment, it is able to change the environment to its liking. It is born entirely incapable of surviving by its own efforts and has to depend on older members of its race for its very life for ten or a dozen years, about a seventh of the time it will be able to remain a living organism. Unlike the ants, no two of these larger creatures are alike. Unlike the ants, they have no fixed and unchanging method of meeting their environment. Not only do no two react to life in exactly the same way, but each one of them changes his reaction pattern from day to day, from year to year, so long as he lives. The boy does not meet situations as the baby did. The man does not act, under the same circumstances, as the boy did. This generation does not respond to life as the preceding one did, and the one to come will behave still otherwise. We say that they learn by experience. Their learning prompts them to change the world in which they live, and the change necessitates more learning, more adjustment. It is a complicated process, and it still remains to be proved that it is more efficient and more successful than the experiment with the organism that is

so perfectly adapted to its environment that, to survive, it has no need to alter its predetermined pattern of behavior.

Perhaps we human beings, a million years ago, were creatures of instinct. Perhaps with the invention of tools and, especially, that most useful tool of all, language, the ready use of words and verbal symbols, we sloughed off our instincts and learned to depend on our inventions instead. Be that as it may, the modern investigator can find very little in man and man's behavior that can now be classed as instinctive. The human animal when it first sees the light of day is an exceedingly complicated combination of different sorts of cells, but its first reactions to the outside world are fairly crude and simple. At this stage all action that takes place is more or less mass action with little meaning, little reference to the kind of stimulus that set it going or to its location. Pinch a toe or an ear or shine a light in its eye, and the legs are drawn up and thrust out, the arms flail about, the eyes move without fixing a focus on the environment, and perhaps random chance sounds are made with the organs of speech.

Only a few specific reactions can be made to appear in response to certain changes in the infant's surroundings. Make a sudden loud noise in its immediate vicinity, or hold it in your hands and lower them suddenly so that the child feels the loss of the supporting pressures of your hands on its body; in either case the reaction is the same, a stiffening of the muscles, an increase of blood pressure, a catching of the breath, and a cry which we interpret as a cry of fear, although we do not know what the baby is really experiencing. Or, if we hold its flailing arms or legs so as to restrain their motion, we may expect a somewhat similar reaction, but with a different cry which, for want of a better knowledge, we call a cry of anger at the restraint. Call these "instinctive" reactions, if you will, or merely call them "inborn patterns" of reaction. They do not have to be learned. All babies have them from the day of their birth. They are standard equipment for the human infant. There

may be a few others that come along later as the machine matures with growth, but we are less sure of their nature. They *may* have been affected by the learning that takes place hour by hour from the moment of birth onward. These and a few reflexes are all the child has at the outset. All else is learned. The complex behavior of the halfback executing a fake reverse back of the line, the violinist playing *A Melody in F*, the mathematician working a problem in calculus, all are exhibiting examples of learned behavior.

If the things that one experiences in his life do not change his behavior, he is incapable of learning. This is true of the idiot. No matter how many times he may put his hand on the hot stove, he never learns that to do so again will bring the same painful result. He never learns by experience. His ways cannot be changed by experience. In general, learning is merely a process of coming to respond to a part of a situation where originally the whole situation had to occur to bring the response. The first time the infant sees its mother put on her hat and coat, pick up her pocketbook and go out to the garage, saying "Baby want to go by-by in auto?" the situation has no significance until the garage door is opened, the child put in the car, and the drive started. Next time it happens, the whole act does not have to be repeated. The baby may start to say "auto" as the garage door is opened or later as the key is taken from the purse. Still later, merely saying "Baby want to go by-by in auto?" will start the child toddling toward the garage. A small and simple part of the original situation now stands for the whole somewhat complicated original setup. The child has "learned." Its present behavior has been modified by its past experience. It has formed a new habit. The habit of associating the word "auto" with the experience of riding will likely remain with him as long as he lives. The sound of a word has been substituted for an elaborate combination of sights, sounds, and acts.

Not all learning is in the realm of words. We can learn with our muscles also. Your fingers learn how to tie your shoelace. If I asked you how you go about the familiar process of making the double bowknot in the strings, you would not be able to tell me in words. You do not even know, in words, what the various motions are, what fingers you use, or how you handle the operation. Your fingers know. The muscles have learned a habit that is independent of verbal learning. It is as much a learned habit as is the ability to count up to 100. It is in a different system of your bodily mechanism. Riding a bicycle, feeding a punch press, and signing your name are habits of the muscular system. How fixed such habits are may be judged by the fact that after one has learned to ride a bicycle, he can still manage one although he may go for forty years without being astride of one. The banker depends on the fixity of a muscular habit of yours when he cashes a check with your signature on it.

There is another class of habits that we begin to form almost from the moment of birth. Emotional habits. An emotion is a stirred-up state of the organism wherein changes occur in glands, digestive apparatus, heart action and blood pressure, rate of breathing and its character. It is an internal disturbance. Fear and anger and pleasure can be aroused in a newborn babe, but by only a very few quite simple processes, such as a loud sound or a fall, restraint of bodily freedom, feeding or stroking, or bodily comfort.

Most of our fears and rages are learned and so are most of our pleasures. A child in our apartment goes into paroxysms of fear when it starts to rain. Our dog does not even wait for the rain but shows fear when the sun goes behind a dark cloud in the daytime. The loud sound of the thunder has become associated with the other conditions that usually accompany an electrical storm. Darkness, rain, lightning, and thunder are the total situation, but, through learning, any one of them brings the emotional response of

fear that naturally belongs to the thunder. You do not have to teach a child to be afraid of a storm. You may teach it not to be, but that is a long story, too long to take up here.

To unlearn an emotional habit, you must learn another emotional habit to take its place, and that is a slow process. The thing we are interested in just now is that the child has learned to fear rain which originally brought no fear reaction at all. It has transferred its fear or spread it out to cover a mere portion, and a normally nonterrifying portion, of the whole fear situation. Understand, the baby is not afraid that it is *going* to thunder. It is not the fear of anticipation. It is a fear of the rain. So the child who has been scared by the banging of a door in the dark is afraid, not that a door is going to bang, but of the dark.

The college senior is afraid of more things than is the two-year-old infant. He has been learning fears for twenty years, and he has retained most of those he learned before he was two. And if he does not, by good luck or good management, learn new habits to take their place, he will carry these emotional habits with him to the grave if he lives to be eighty. There was a man of forty-five in one of my classes who told me that he had always been much ashamed of the fact that he is more afraid in the dark than is his own young daughter. And if the dark place is small or narrow, as in a clothes closet or hallway, he is not only afraid, he is terrified. Until we discussed the matter in class, he had always regarded it as some peculiar form of cowardice or "yellow streak" which his common sense and reasoning had never been able to overcome. Actually, it was an emotional habit that he had learned when he was six years old.

He remembers that he was playing around in the attic one day while his mother was clearing out some old trunks. A neighbor happened to drop in with two children of about his age. His mother, anxious to get the work done, called down to the neighbor, "Come on up and bring the chil-

dren." The children had a great time playing around, and when the two women finally went downstairs to visit, the youngsters remained in the attic. They got to playing pirates and two of them, the host and one visitor, crouched down in an empty trunk which stood for the pirate ship. The other boy was a savage on an island and they were sailing in to attack him. The play was too real for the savage, and he rushed the ship and slammed down the cover which promptly locked. The savage, apparently afraid of what his mother would do if called for help, tugged frantically at everything about the trunk he could get his hands on, but without success. The pirates inside were yelling lustily, and the more they yelled the more scared they got. Finally, the savage got sufficiently frightened himself to run down to his mother, but even then he did not at once tell what the trouble was. By the time the mothers had learned the truth and found the key and opened up the trunk, the two pirates were about half suffocated and entirely beside themselves with fright. And forty years later a narrow dark place brought up exactly the same sense of terror although the victim had never connected the emotional habit with its origin.

Similarly, an "inferiority complex" may be learned by the youngster whose older brother, schoolmates, or parents have repeatedly told him that he is awkward, stupid, incapable. "Oh, you can't do that; let me do it." Or, "Why can't you be like other boys?" Self-pity is thus learned by the child who is often unjustly punished, or thinks he is, which is just as effective. In a world of all-powerful adults there is not much he can do but be sorry for himself—"Nobody loves me; I'll go out in the garden and eat worms." Such an emotional habit marks the suffering martyr who says, "Never mind me. The rest of you go out and have a good time. I'll stay at home and wash the dishes."

Fortunately, not all emotional habits learned in childhood are undesirable ones. By exactly the same process habits

of self-reliance, cheerfulness, courage, and perseverance can be acquired and, once built in, can remain as distinguishing traits for a lifetime.

It is largely through such "conditioning" of emotional habits that our personalities are built up. We say that our friend has a pleasing personality or a gloomy personality or a commanding personality. Think of the hundreds of descriptive words that we use in speaking of the personalities of those we know, and notice that nine-tenths of them are adjectives derived from the names of emotions, feelings, moods.

By training, by chance, or by intentional design, people learn ways of responding to the events of their lives. In general a system is built up by each of us in meeting the circumstances and situations of our daily lives, and we tend to rely on that system to meet whatever comes up from day to day. One adopts one method, another adopts another method, but each time a method is applied, it tends to become that much more of a habit of response. The trend starts in childhood and by the time the individual has reached the stage of adulthood it has become sufficiently habitual to be the dominant method of reaction. Our friends can depend on our tendency to use the method that we have adopted and so can be reasonably sure in their forecasts of the way we shall react to any new situation. "He will stop at nothing to attain his ends; opposition merely stimulates him to greater effort." Or, again, we hear it said that another person is guided entirely by his feelings. "Get his sympathies aroused, and he will give you the shirt off his back." And of the "cold-fish" citizen who reasons a thing out before he does anything or gets at all excited about it, we say, in exasperation, "He has no more feelings than a block of marble." He has. It is just that he has learned to substitute verbal reactions for an emotional response. He has found, or thinks he has, that it pays to look on all sides of a situation before getting emotional over it.

These are the three different ways of responding to life's situations—with action, with emotion, with words. Nobody relies wholly on any one, or any two, of them. We all use any one of them or all three at one time or another. The difference in personality lies in the degree to which one has learned to rely on one system more than another. It is not a matter of exclusion of one set of habits by another, but of predominance; one method becomes the predominant one, leaving the two others usable, but in a subordinate position to be called into action only in certain situations, or only after the dominant method has failed to bring results.

Men can be great or insignificant, successes or failures, and be predominantly responsive in the action mechanisms, the emotional structure, or in the habit of verbal reasoning. We have had three presidents who were, respectively, representatives of each of these dominant methods of reaction. Grant was a man so devoid of emotion that his pulse rate never rose or fell with the changing fortunes of a battle in which the fate of a nation hung in suspense. Almost without a sense of humor, he cared so little for reading that he had no library even on military strategy and warfare. The whole of military strategy, he said, was in knowing where your enemy is and hitting him with everything you have. "I'll fight it out on this line if it takes all summer." Direct action.

Washington was predominantly emotional. All the state papers which are traceable directly to his hand are expressions of emotion. His heart bled for his shoeless soldiers. His anger at the cowardice of his raw troops would have caused his capture by the British had it not been for the cooler head of a colonial sergeant. Being emotional, he became the symbol around which the colonies rallied. No man of less lofty sentiments or less intense feelings could have held together the ill-assorted rabble that made up his army or the leading men of the various colonies whose one common interest was their implicit faith in Washington. Washington would have lost the cause of

the North in the war between the states. Grant would have lost the Revolution. Each was great in his own way.

Calvin Coolidge was president and fitted his times as did the two others. Neither emotion nor great action was called for. Had they been, he would have been a misfit. "Keep cool with Coolidge" was the slogan of his campaign committee. It was impossible to sell him to the people on the basis of a public emotional appeal. Lacking action, he accomplished little of an outstanding nature. Lacking emotional expression, he never aroused intense partisanship in either support or opposition. Never excitable, he entered into the work and the responsibilities with calm deliberation and when he quit, he merely announced "I do not choose to run." Such a man is surely not dominated by his emotions or by a love of action.

In any walk of life we see the same differences in the predominant traits of those who have achieved conspicuous success. Some depend mainly on pure action, some are largely dominated by emotion, some by reason. Joe Louis, of a race of people normally highly emotional, as famous for his "dead pan" as for his lethal punches, could hardly be called either "emotional" or "reasoning" in his dominating system of action. Tony Galento and Max Baer, in the same line of work and with comparable abilities, if not actually predominantly emotional, are certainly much more emotional than Louis. Gene Tunney and, to a degree perhaps, Max Schmeling also were, so far as such a thing is possible in the field of professional fighting, predominantly dependent upon their ability to analyze the other fellow and outsmart him. They relied much more on the strictly reasoning side of the game than did any of the others.

So it may be said that whichever system predominates in the life of a man, it is possible for him to go to the top. The point to be brought out here is merely that each of us has his dominant method of reacting to life. Common sense dictates that we determine what it is and so direct

our efforts that we can make the most of it for our own happiness and that of others. And, by the same token, we should study those with whom we work and be guided in our relations with them by their predominant reaction patterns. What brings results with the man of action angers the emotional man and is worse than wasted on the reasoning individual. The logical approach that may win over the reasoner to your side makes no appeal to either of the others. And the emotional appeal wakes no response in the man who makes no use of his emotions and it is useless with the reasoner who prides himself on his ability to "see through" it.

CHAPTER 4

APTITUDES AND ABILITIES

No matter how much money might have been spent on musical education for me in my childhood and youth, I would still not be a musician. I would still sing off key and still not know whether the piano is in tune or out. I like to sing and I enjoy my own singing. Nobody else does. When I sing in a group everybody else stops. I lack musical aptitude, and without the aptitude, the ability cannot be developed. I lack what the psychologists call *fine pitch discrimination*. If I am within half a tone of the piano accompaniment, it sounds all right to me. Fractions do not bother me. I am not even sure that whole tones do. It is not lack of acuteness of hearing. I can hear faint sounds that many other people with musical ability are unable to hear. It is not something that has come upon me with advanced age. I have always lacked the aptitude for distinguishing the differences in pitch that are as pronounced to others as are a note and its octave to me.

With the aid of present-day tests I can measure just how bad this defect is—and it is pretty bad. When I was in school, there were no such tests, but we had a singing teacher who evidently did not need scientific tests to discover my lack of aptitude. When she was dividing up the school in assembly one day so as to seat together all those who sang bass, those who sang tenor, alto, soprano, and so on, there were a few of us who did not know what we sang. She had us come up to the piano for a test. She struck a note, and a fellow ahead of me sang it, and she said, "Sit with the tenors." The next fellow sang the note, and she said "Bass." And then I sang it, and she said nothing but struck the note twice again and said,

"Sing that." I did. And she struck it three or four times, and I sang it again. Then she looked up and asked me in scathing tones if I were trying to be funny. I assured her that I thought I was singing the note correctly. She asked whether my voice was changing, and I told her it had changed two years previously. She said, "You take the technical part of the work, including the written examinations, but don't sing."

No amount of training would ever correct the defect. I might have learned to play the piano, but someone else would have to tune it. I could never have learned to play the violin. Without the aptitude the ability cannot be developed. If you have an ability, you necessarily have the aptitude on which it is based, but the reverse is not true. I have no ability as a cartoonist, but I do have an aptitude for freehand drawing which might have been developed into an ability, but which never was. I probably have an aptitude for matching colors, although I have little ability along that line because I have never made any effort to train myself and build on what aptitude I have.

This is quite a fundamental consideration in industry. Men are born with different aptitudes. Different jobs call for different abilities. Place a man who lacks mechanical aptitude on a job calling for mechanical ability, and no matter how long he sticks at it, no matter how much patient effort is put into training him, he will always be a misfit. If, on the other hand, he has the aptitude but no experience and, therefore, no developed ability in that particular job, training and practice may make an excellent mechanical operative out of him. The ability can be developed if the aptitude is there. The point is to determine whether the aptitude is there before time and money are spent attempting to develop an ability. Not only are time and energy wasted in trying to develop a nonexistent aptitude, but something undesirable happens to the man himself. He earns the reputation of being a failure. He may even acquire the habit of thinking of himself as a failure. Every

man has an aptitude for something. Match the aptitude and the job. Develop the aptitude into an ability that meets the requirements of the job, and the same man who in the former situation would have been a failure develops into an outstanding success. Actually, if an organization or a supervisor in the organization attempts to make a man into a mechanic, or a bookkeeper, or a draftsman, or an executive, when the man lacks the basic aptitude necessary for success in the work, it is not the man who has failed, but the organization or the supervisor. Proper shaping and proper sharpening of the tool are necessary if tough steel is to be cut at high speed, but no amount of care and skill on the part of the blacksmith, the toolmaker, or the tool dresser, will make a successful high-speed turning tool out of soft steel.

Twenty years ago I rode to the West coast on the Overland Limited and enjoyed the two days of rugged scenery but found the three long evenings a bit boresome. A well-dressed, alert and interesting man of about fifty sitting across the aisle from me was evidently having the same experience. Meeting from time to time in the smoker, the diner, or the club car, we gradually got into conversation. I had learned he was traveling for one of the largest industrial corporations in the country, but it was not until the last evening that I asked him directly in just what capacity he was employed. He smiled and replied cryptically, "There are three of us in the company. We have no titles. Our job is to find the thirty-third man." That was evidently intended to arouse my curiosity and it did. I asked the necessary questions and learned that this corporation had come to the conclusion after long years of experience that about three men in a hundred are outstanding—one man in thirty-three. Ninety-seven per cent of the personnel are run-of-the-mine. Three per cent have the makings of something much better, the exceptional aptitudes that, under proper supervision and adequate opportunity, can be developed into extraordinary

abilities. It was this fellow traveler's job to find such men; to ferret them out, wherever they might be found, in the lowest of the workers' ranks or in the levels of the supervisors. He told me that if he picked a man as a "thirty-thirder" and recommended him for promotion and he later was proved to be mistaken in his judgment, there was no criticism from the head office. But, if he overlooked a "thirty-thirder" and the man later left the company and went with a competitor or with any other company or set up for himself and made good in a big way, it would cost him his job. The company felt that the one unforgivable sin of management is to fail to recognize aptitude in its ranks and to neglect to develop that aptitude to its utmost as an ability. And it is.

I do not know whether this man's company is doing the same thing today or whether my acquaintance was among those sidetracked by the changes that have come in the conduct of business since that day. I have often wondered why the system never became general. Can any man who calls himself a manager, a superintendent, a foreman, or a personnel officer justify failure to discover the aptitudes that exist in his own force and to develop those aptitudes into profitable abilities? He is not unlike the man who put in thirty years of hard labor to raise half a bale of cotton to the acre each year while under his feet all the while was a pool of oil waiting to make him a millionaire if he only had the sense to know it.

Aptitudes and abilities—how are you going to recognize them? Abilities are as easy to see as the clear noonday sun. If abilities remain hidden, it is because no one is interested enough to look for them. If you want to know whether a man has an ability, give him a chance, and if he has ability he will demonstrate it. You may not know that he has it, but he does. Most of us, in the keen competition of modern life, have to make the most of what abilities we have, so they usually find expression in our work, and we are generally credited by others with having

them. With aptitudes it is otherwise. A man may have a valuable aptitude and himself be unaware of it. Certainly under such circumstances, others would not suspect his possession of it. The Texas farmer did not know that he had oil on his land until some geologist told him so. Who knows how many Napoleons have lived and died at a clerk's desk without ever suspecting that if life's circumstances had been otherwise, they might have led armies or ruled kingdoms? How many men have served their time at the bench who might have reorganized their companies and turned loss into profit if unsuspected aptitudes had been developed into useful abilities?

In the next two chapters we shall have something to say about objective means for detecting aptitudes, that is, formal aptitude tests by which even the undeveloped aptitudes may be detected. The tests are still somewhat crude, and the field of the aptitudes has hardly been scratched as yet. Our fellow traveler who picked his three men in a hundred did not wait for the development of objective tests. He put men in situations which would force the development of aptitudes if they had them. He was continually devising new trials, putting men into new problem situations to see if they could get themselves out and how they would go about it;—"root, hog, or die" situations. If the man did not "have what it takes," he did not get out; he probably did not even try to get out. If he had it, he mastered the situation, often as much to his own surprise as to that of those who had worked with him for years without a suspicion that the aptitude was there.

We have said quite a lot about aptitudes and their importance, but we have not as yet said what they are. Apparently, they are inborn capacities. You either have them or do not have them. Some have one kind and some another. Nobody is without aptitude of some sort. Some aptitudes are quite general in their nature and some are specific. Musical aptitude would be classed among the general ones. Aptitude for the violin would be specific.

Many men have great musical capacity who cannot play the violin. Even the specific aptitudes may be complex and involve the possession of many components. With marvelous musical aptitude a man could not accomplish much with the concert organ unless he also possessed excellent muscular coordination, and muscular coordination is an aptitude in itself.

One of the general aptitudes about which we are most concerned is intelligence. Some unfortunates, the congenital idiots, are born without any, but they are an exceedingly small percentage of the total population. The rest of us have some. Some of us have a great deal, others less. But, whatever our endowment, we must get along with what we have. We may increase our learning, our fund of knowledge, but we cannot increase our intelligence. I do not mean to say that a baby is born with all the sense he is ever going to have. A child who is going to grow up into a five-foot man or woman is not born five feet tall, but if he is five feet tall when he is twenty he will probably never be six feet tall if he live to be eighty. In general the lad who is going to be a six-footer is taller at eight or ten years of age than is his playmate who is going to be a five-footer. So it is with aptitudes. They all start from zero at birth, so far as we are able to judge by any measures yet available, but the child who is going to be a genius will be showing superiority over his less gifted companions in the fifth grade in school. My present lack of musical aptitude was easily detectable long before it was publicly shown up in high school. Mozart, on the other hand, was composing when he was six years old.

Another interesting factor is that even though you apparently start with zero at birth and continue to grow in aptitude as you get older, you will have all the aptitude you are ever going to have when you are around fourteen, fifteen, or sixteen. This includes intelligence. The reason why this is difficult to believe is that we confuse intelligence and learning. Learning is the result of training and, there-

fore, an ability. Intelligence is the native capacity to learn, and that stops increasing at about fifteen years of age. Does this mean that at thirty-two you are no more intelligent than you were at sixteen? This is a bit of a shock to most people when they hear it for the first time and they are not inclined to believe it. It does not seem to worry them that they are born with as many hands as they ever will have and that those hands are as large at maturity as they ever will be. It causes no concern that they do not keep on growing taller year by year at thirty and forty and fifty. But intelligence—that is something else again! Look at it this way, and it becomes more understandable: Think of your intelligence as a tank, a receptacle, with which you are born and into which you may put useful things as you go along through life. Like your hands, the tank is small to start with but keeps growing up to a certain age and then, like your hands, stops increasing in size. Some people's hands are larger than others; some people's intelligence tanks are larger than others. Because my hands stopped growing at, say, eighteen does not mean that I cannot go on learning to do more and more things with them. I learned to steer a car with them after I was forty. I could have learned just as well, probably a little better, at eighteen, if there had been automobiles then. In just the same way I put into my intelligence tank the things necessary for a Ph.D. degree in psychology after I was fifty.

This immediately brings up another feature of the question. If the intelligence tank starts at near zero and grows until fifteen, what happens to it after that? Does it shrink? Does it fill up? Is that why you can't teach an old dog new tricks? We shall have more to say about this alibi of the lazy man later on. Actually, the best information we have at present indicates that there is some reduction in capacity to learn after perhaps thirty years, but it is so slight and the findings are so various that it is

not safe to say that any real loss occurs until around fifty or fifty-five and even then it is only a small percentage. In many cases loss of capacity to learn does not occur until in the seventies, and when it does begin to set in, the deterioration is slow. The reason why the old dog does not learn new tricks is that he is so satisfied with the old tricks that there is no incentive to learn new ones. If we are looking for a good excuse for not taking on new ways of living, new lines of thought, we shall have to find a better one than this. If modern psychology had done nothing else than explode this old notion, it would have been worth all the time and energy that have been expended in its development.

So much for the way aptitudes appear and develop in the life of the individual. How do they distribute themselves in the population in general? This is something the supervisor should be much interested in. He wants to know what chance there is of finding the aptitudes he is looking for in his working force. Here again psychology has a reliable answer. Take any trait you please, musical aptitude, intelligence, muscular coordination, and measure it in the entire population, or an unselected cross section of it, and it will be found that, like any other natural characteristic, its distribution can be predicted with mathematical formulas. Let us use intelligence as our sample. Consider the idiot as having the least degree of the trait and the greatest genius as having the most. There is a great difference between them. Divide this difference into six equal steps. What percentage of the population will be found in each of the six groups? In the two extreme groups, those furthest from the average, above and below, there are 4 per cent: 2 per cent in the first or lowest group, the feeble-minded; and 2 per cent in the sixth or top group, the geniuses and near geniuses. In the two groups nearest the average there is 68 per cent of the population, 34 per cent on each side of the average, the third and fourth

groups. That leaves the two groups intermediate between the average and the extremes, the second and fifth groups. In each of these we find 14 per cent. Thus we have about two-thirds of the people close to the average, with a little over a quarter of them somewhat better or somewhat worse, and about a twenty-fifth of the total at either extreme. This, be it noted, is in the population as a whole. It would not be true in our schools because the lower groups have been eliminated. They cannot do the work of the school curriculum. It would not be true in industry. The lowest grades of intelligence do not even try to enter industry, and of those a little better than the defectives, the vast majority are eliminated by the employment office while the few who do slip by are unable to perform their duties and are eliminated by the foremen. Thus the lowest group is not found in school, and they and the group above them are not found in industry. From that point up, however, the curve of distribution is usually normal, that is, about as it would be found in the general population.

This is the way nature distributes its qualities. The heights of the ten-year-old children in the country, the weights of the women, and the length of men's feet would be found to follow the same laws. Suppose we measure all the leaves on a large willow tree and find that the longest one is six inches long. If we arrange six boxes and into one of them drop all the leaves that are not over one inch long; into the next all that are over an inch, but not over two inches long; into the third all those that are over two, but not over three; and so on to the sixth box where we would put all over five, the longest being six inches; we would find 2 per cent of the leaves in each of the two end boxes, 14 per cent in each of the next boxes, and 34 per cent in each of the two middle boxes. Thus the "common people" are in fact the common people. Two-thirds of us cluster around the average, and science vindicates Abraham Lincoln's saying, "We know the Lord loved the common

people, he made so many of them." And our friend who was looking for the "thirty-thirder" was being quite liberal. Only two in a hundred are in the sixth group. When we consider that the two lower groups of the total population are missing in industry, his idea of three in a hundred was probably quite reasonable.

CHAPTER 5

TESTS

In the preceding chapter we concluded that Washington could not have won the Civil War and that Grant could not have won the Revolution. Einstein could not paint a Mona Lisa, nor could Leonardo da Vinci evolve the theory of relativity. Different times call for different men, and different tasks need different talents. Greatness is not a single trait but a combination of traits brought to bear upon a situation which demands that particular combination for its solution. Most of us are not going to be Napoleons or Bismarcks or Newtons, but what was true of them in a large way is just as true of us in our lesser spheres of activity. We all have abilities or aptitudes of some sort and have them in sufficient degree to achieve success if we find situations in which the application of those aptitudes and abilities can be expected to bring results. The man who is successful and happy in his work is the man who, by good fortune or good judgment, has abilities and opportunities to exercise those abilities for a useful purpose.

If this has importance for us as workers—and we are all workers in one way or another—its importance for us as employers or supervisors of the work of others is multiplied by the number of such as look to us for employment or supervision. Aside from all humanitarian considerations, we are vitally interested in placing the right man in the right job, in matching up the abilities and aptitudes with the work to be done. Nothing human is ever 100 per cent perfect. No organization succeeds in placing every man where he will be most effective. Compromises must be made, and misfits must be tolerated. But the effectiveness of placement and supervision can be judged by the degree

to which this factor of matching jobs and talents has been given intelligent consideration.

In the vast majority of corporations this has been left to the inefficient and expensive method of cut and try, of trial and error. Put the man on the job. If he makes good, you are lucky. If he fails, move him to another job or fire him, and try another man. By and by you will get a man who can handle the work satisfactorily. You do not fire him and he does not quit and the job is filled. And all the time you may have been overlooking a man in your own organization who could do the job still better if he had the chance. And the man you have hired might possibly do the work of the overlooked man better and be happier in that work than in the work for which you have hired him. True enough, you may reply, everybody knows that is the state of affairs; you may wish it otherwise, but how are you going to remedy the situation?

One thing is certain. It will not be remedied by continuing the old order without making a constructive effort to substitute a better one. Applied psychology can do no more than show the way. The actual steps will have to be taken by industry itself, and before it arrives at that stage, industry will have to be persuaded that some better method can be devised. It is much easier and much more usual for management to dismiss the whole question as an academic one and one in which practical men can have no interest. Ignorance is always contented and always resists change, but progress is not made when such factors are in control. Fundamentally the resistance is based upon a misunderstanding of the manner in which industrial tests are constructed. In our industrial classes, which have included well over a thousand men from plant managers down to minor foremen and which have had in their membership many men from the personnel departments, the commonest remark when the subject of tests was brought up was "Yeah! They tried tests over at the Jones Manufacturing Company but threw them out when

they found that the office boy made a higher score than the president." This is good for a laugh in any industrial group, and it seems to dispose of the question rather finally and completely. This is especially true when an investigation shows that the statement seems to be true. The Jones people did try what they supposed to be tests, and they did find that there was no value in them for predicting success on the job. The fallacy in the case is that the Jones Company's people were mistaken in thinking they had a test. Had they had a scientifically constructed and calibrated test, such results as they experienced would have been mathematically impossible. The situation is not made any better in the eyes of industrial management when we are told that the so-called "test" was concocted and sold to them by a psychologist from one of the large universities. When such a thing occurs, as it has more than once, it indicates a justifiable ignorance and faith on the part of management and an unjustifiable ignorance, if not actual unscrupulousness, on the part of the psychologist. Not every physician is a nose-and-throat specialist. Not every psychologist is equipped with a practical working knowledge of tests and the thorough grounding in the mathematics necessary for evaluating his results. Test construction is a specialty in itself. Not one psychologist in a hundred is equipped to engage in the work. To understand this, let us examine the difference between the Jones test procedure and that of the trained test specialist.

Upon questioning the personnel manager at the Jones plant we find that the man who "sold" them the test promised to construct a pencil-and-paper test which would show what men should be hired and for what jobs and which men in the organization should be promoted. He was a convincing talker and he reinforced his arguments with examples of corporations where such tests had been used for a decade with excellent results. He was retained at twenty-five dollars a day and given an office in which to do his work. In less than a month he had produced a

formidable-looking printed document of four pages the size of typewriter paper on which appeared 187 questions which the applicant was to answer with "Yes" or "No" or, if unable to decide either way, by a question mark. He had seen tests so arranged and knew that they produced good results, so he followed the accepted technique. He had framed a set of special questions which he felt had direct application to the various jobs in the Jones plant. Certain of the questions he thought were such as a manager should know the answers to but of which an office boy might be ignorant without impairing his usefulness as an office boy. In the same manner he included items which would distinguish the foreman from the punch-press operator. In this way he set critical scores. If an applicant made less than 40 he should be rejected; if he made 60 he could profitably be hired as a worker on the assembly belt. If a worker in the organization made a score of 112 he was of foreman caliber, but a division manager should make at least 137. Having laid down the rules, he collected his fee and departed.

The personnel department began at once to submit applicants to the test and to hire or reject them according to the prescribed scale of scores. The results were disappointing. The score made seemed to have little relation to success on the job. Being of a practical turn of mind, they decided to try the test out on men who had been working for them for years and whose ability was known to the second decimal point. It was then that they found the office boy beating the executives. The test was obviously testing something. The fact that different scores were made is proof of the fact that it was somehow registering some sort of a difference among those who took it. Perhaps it was merely an "intelligence test." Some office boys have more intelligence than some managers. Managerial ability also requires something other than intelligence. We all know highly brilliant people who are incapable of managing their own affairs, let alone those

of a manufacturing company. The psychologist had a test, but not a test of the aptitudes and abilities required for success on the various jobs of the plant. He had just as good a chance of picking the right man as he would have had if he had required them to draw cards blindfold from a deck of playing cards, hiring those who drew deuces as office boys, queens as typists, and kings as foremen.

There is no room for argument that the "test" failed of its purpose. It was worse than useless in that it was actually misleading. Worse still, it undermined the faith of that management in the efficacy of tests, and that loss of faith was communicated to many another personnel department in the city. It provided a most welcome excuse to many a man for not looking into the matter of tests for his own organization. From then on if an executive or a supervisor asked him whether tests would have any value for their plant, he no longer had to argue the question. He had a sure-fire reply which laid the question to rest for all time, "Tests are the bunk. The office boy beat the president."

After such a conclusive demonstration the burden of proof obviously lies with the person who still maintains that tests have real virtue. The best method of establishing this is to describe in detail just how a real test specialist would go about making up a test for The Jones Manufacturing Company or any other corporation or organization.

At the outset it should be noted that the chance is very remote of securing one brief test which will serve to separate and select candidates for employment at all levels, show to which job they should be assigned, forecast their probable success on such job, and put the sign of approval on those who should be considered for promotion. That is asking too much of a single instrument, however well designed it may be. It is true that there may be certain factors that will enter into success in any job. These factors can be combined into a general preliminary test common to all applicants or the items can be included in

their turn in each of the several tests which may be necessary to meet the requirements of the different jobs. This is a detail determined by convenience or personal preference in each organization.

Let us assume that you have been selected to set up a series of tests for selecting workers for an organization that has been engaged for many years in the manufacture of articles involving the making and finishing of castings, punchings, wood or plastic parts, lathe work, welding, soldering, and general assembly functions. There would be the usual office force, sales organization, shipping department, and a suitable supervisory organization. No one test could blanket all these requirements, and nothing of the sort would be attempted. Under the circumstances, how would you go about fulfilling the assignment that had been given you? First and foremost, if you are qualified to do the job at all, you would make it clear that you do not have the slightest idea what tests will be needed, what they will be like, whether they will be commercially and economically desirable, even whether, in the present state of the art, any workable tests at all can be set up. Those are the items that you are there to determine. If you have strongly preconceived notions on any of these items, the chances are against your working out a satisfactory test system. All the expert test builder has at the outset is an open mind and the necessary techniques with which to ascertain the answers to these questions in cold-bloodedly mathematical terms which, when finally worked out, will leave no doubt in the mind of anyone whether there is a test there and, if so, just how good it is. It is not going to be a matter of pride, prejudice, opinion, or guesswork. Either there will be a test, or there will not.

The first part of your work will be a general survey of the whole organization and its past employment records in order to find out in what fields there may be indications that some form of test program might yield better results

than the present methods, if proper tests could be constructed. Obviously, in those classifications in which there are but few employees and in which turnover in the past has been low, there would be no economy in undertaking the task of setting up a test for their selection, since even though such a test when completed might be superior to present methods the savings would not equal the expense of the investigation and preparation. In other words, there is no problem here needing solution. But your preliminary survey shows you that there are other jobs employing men in considerable numbers and that the turnover on these jobs has been rather high in the past and is likely to continue so if present methods are retained. You are justified in assuming that here there is a possibility that a test program might yield returns that would warrant its being undertaken.

After considering all the factors, you would select that activity from among this group in which the most difficulty had been experienced in the past. In order to make the case more concrete, let us assume that you decide to concentrate on a test for the selection of assembly-belt workers. You do not know what characteristics are especially required in order to become a satisfactory assembly-belt operator. All you know is that there are eighty-seven of them in the plant and that in order to keep the force up to that level, it has been necessary to hire on the average thirty-nine new men every year. You are told that this is both expensive and annoying and that if you can devise a system which will materially improve this situation it will be well worth while. And this is all the information you have when you start to work.

You are still a long way from being ready to start compiling your test. You may have read that the belt is deadly in its monotony, that no one with intelligence enough to do anything else will stick on such a job, that it calls for a person of little active imagination, a stolid, routine type of personality with no special aptitudes of any

sort. These may be facts when related about the assembly belt of some other plant. They may or may not be true in this case. In any event you will make no assumptions as to their truth or falsity here. You will merely start to gather reliable information about the job. You will spend hours watching the workers, taking a hand at the job yourself now and then to get the feel of it. You will talk to the operatives and to the supervisors and you will make notes of all you see and hear. You will talk with those who have been longest on the job and who like the work and with those who have tried it and disliked it and quit, as well as those who have liked it but failed to do the work sufficiently well to keep the job. You will talk to the supervisor to find out what he thinks the job calls for, what traits go toward making a good operator or a poor one. You will ask the successful workers what they think they have that the poor ones lack and you will try to find out from the unsuccessful what they consider the explanation of their lack of success. Analyzing your own observations and experience, you will set down your own guesses as to what it takes to do the work and like it.

If you do this work without previously having made up your mind what you are going to find you will probably turn up some interesting data that runs counter to your own best preliminary guesses and directly opposite to the opinions of some of the management who have been in the plant since the belt system was first installed. But whatever you turn up at this stage of the investigation you will regard as mere hints suggesting vaguely the direction in which you will probably find it profitable to proceed. At least you have established this much—there is a difference of some sort among those who succeed and like it, those who like it but fail, and those who dislike it and want none of it. When you have definite evidence that these differences do exist, you may begin to feel fairly sure that some form of test may be devised to measure them in advance of

actual trial at the job. You know that the differences indicate that one possesses certain traits that the other lacks. From past experience you know that it is probably not merely a single trait but rather some happy combination of traits in the one who fits the job, a combination some part of which, and they may be different parts in different cases, is lacking in the one who is unfit. Note that it is not a matter of superiority but of fitness for this particular situation. You do not know what these traits are, and, oddly enough, you may never know even after you have devised your test and found it successful. Furthermore, you do not care. Let us show how this can be true without in any way reflecting on the excellence of your test or jeopardizing its successful operation. It is only when this fundamental fact is grasped that we begin to understand what tests really are and how they operate.

You are, then, going to try to set up a test that will measure a combination of traits, and yet you do not know what the traits are. The explanation of this apparently contradictory statement is simple enough. One man succeeds and another fails at a given task because the two men are different, have different combinations of traits. One man makes a good score on a test and another makes a low score because the two men are different, have different combinations of traits. If, now, you can find a test or a battery of tests on which the man who succeeds on the job always makes a good score while the man who fails always makes a poor score, and if this is true, however many men you test, you are justified in assuming that the same traits which permit him to make a good score make for success on the job. The logic of the case is simple: If a man who is good on the job always makes a good score on your test and the man who is poor on the job always makes a poor score, you are fairly safe in assuming that a man who makes a poor score on the test will probably not make a success of the job if he is put on it, whereas those who do well on the test probably will make good on the job.

All you know is that your test calls for the same traits the job calls for. You do not know what those traits are and you do not care.

It is a simple but a somewhat tedious job to find such items for your test as will give this correlation between score and job success. You may think you have some excellent items for the purpose, but when you try them out, you may find them like the Jones test—they may have no relation to the aptitudes you are looking for. Some good men will make high scores, but so will some failures, and some good men will fall down on the test items and some failures do well with them. No matter how much you have hoped that these items would be good you simply discard them. They measure some trait, but they do not measure the traits that are needed on this job. What you must do is think up as many of such possible items as you can and get as many other people to suggest items as you can and then try them all out on men who are known to be good on the job and on men who are known to lack what it takes to do the job right, the failures. You may start out with a hundred such trial items, and they may be physiological or psychological or sociological in their nature; they may be tests of intelligence, or information, or muscular coordination, or emotionality, or age, race, or education.

Most of your collection will be found to have no relation to success on the job, however promising they looked before you tried them out. A few of them will be found to discriminate between the successful and the unsuccessful. By that we mean that on some of these items the good men will consistently show different scores from the failures. It does not matter whether they are better or worse in their test scores, just so they are consistently different, either always better or always worse than the other group. If nine-tenths of the good men make good scores on a certain item and nine-tenths of the poor men make poor scores on that item, you know that that item is

measuring at least one of the traits that makes for success, and you will include that item in your final battery of tests. If on another item eight men out of ten in each group show the same sort of difference in test scores, you know that this item measures some other trait that makes for success, less important, perhaps, because the percentage is lower, but still a trait that your successful man is better for having. If another item is more successfully answered by only 50 per cent of the good men, you know that it has no value since a man may succeed with or without the trait it measures. If out of your original hundred trial items you find that six or seven are always better met by the better operatives, you can begin to feel confident that you have the makings of a reliable test.

If each item is measuring a trait that makes for success, and if each item measures a different trait, and this we can determine mathematically, then you have a battery that measures the six or seven different traits that make for success and your battery is exceedingly valuable. You do not, however, have to guess as to this. Having selected thus the items which seemed to have significance, you combine them into a battery and give the most weight in the final score to those items which showed the best correlation with success. Then you submit the battery to your two groups, the successful and the unsuccessful. If you have done your work carefully, you should now find that your battery gives a better correlation with success than any single item does for the simple reason that your battery measures many traits that enter into success, instead of only one or two as any single item may. You should now find that all of the eighty-seven assembly-belt men who have stood the test of time make better scores than the men who have failed to make good on the job and that, in general, the better they are, the higher the score they make on the test. You still do not know what you are testing, but you know you have a test that will forecast success and failure.

You are now ready to compare your test with the old method of selection, whatever it may have been. For the next twelve months you submit all applicants to the test, but you do not yet hire or reject them on the basis of test scores. You hire or reject them on the old system just as they have always done it at this plant. But you request the employment manager to record his estimate of the probable success of the applicant. Will the applicant be a topnotcher, a middling good man, or a man who will just barely make the grade? This estimate is made by the manager without his having seen the test score. Your test score is also a prophecy as to the probable success of the man. By the end of the year you will know whether the employment department is able to forecast as well as or better than the test, and on this rests the fate of the test. If the test forecasts more reliably than the interview, it is valuable and should be adopted.

In what has been said about the construction of tests we have attempted to display four factors that must enter the situation if a satisfactory test is to be evolved. First, there must be a recognizable difference between men who attempt to do the work, a group of those who succeed and a group of those who fall down on the job. Second, there must be enough men involved in the two groups so that we can generalize from our results with a fair assurance that what we have found to be true of our groups will be true of any other group of men who have not yet tried their hand at the job. We must have enough men in the two groups to ensure the elimination of chance factors which might be misleading, and the greater our numbers, the greater will be the reliability of our test. Third, we must check our final test against the known abilities of the men in the two groups to make sure that our test actually does measure these abilities or the aptitudes from which they are developed. Fourth, we must rely not at all on preformed opinions, but on statistical correlations at every step in the development of the test and in its final evalua-

tion. On this fourth point it might be well to explain just what is meant by "correlation" since the whole test technique rests on this feature.

Correlation is not merely a general resemblance. It is an exact mathematical quantity determined by a careful and rigorously specified technique of comparison of the two factors to be correlated. In preparation for this branch of the work the test specialist must have at least a year's training in this special field of mathematics. Unless he has this training and makes good use of it, his work in the field of test construction will be worse than useless because it will actually be misleading and harmful. What the test psychologist does is to rank the men on the job and compare that ranking with the scores that they make on the test.

Since nothing in the realm of human nature is perfectly predictable, the resultant comparison will never show a perfect correspondence of the two rankings. Suppose that in the case of the eighty-seven assembly-belt operatives that we have used in this example we call the best man No. 1, the next best No. 2, and the poorest man on the belt No. 87. We give them all our test and record their scores. We give the man who makes the *best score* No. 1 rank, in this new rating list, the next highest score No. 2, and the man who makes the poorest score No. 87. Immediately, our test not being perfect, we shall notice that there is not a perfect correspondence in the two lists. The best man on the job may not make the highest score and the poorest man on the job may not be low man on the test. Number 6 on the job list may be No. 1 on the test; the twenty-seventh man in the job ranking may be thirty-fifth in the test list. The eighty-sixth man on the job may be sixty-seventh on the test. That is about the way we would expect our test to show up if we have a good one. The two lists are not by any means identical; but even a casual inspection of them shows that the men that we ranked in the top quarter of all the men on the job, say those with

job ranking of from 1 to 22, do not appear in the test list below the middle. And those in the bottom quarter of the job ranking, the lowest twenty-two men, do not test above the middle. Number 1 on the job may not be No. 1 on the test, but if our test is well set up he will not be No. 87 or even No. 60 in the test scores. All we can say without resort to mathematics is that, in general, the good men tend to make better scores than the poor men.

By mathematical treatment of the results we can do much better than this. We can say just how high the correlation is between job ranking and test scoring. This correlation is expressed as a decimal. In the case we have described this decimal might be around .65. This does not mean 65 per cent correct. It is merely a "correlation coefficient" from which the statistician can determine how many times in a thousand his test will guess right and what the probable error of the guess will be. The formula that determines these things takes into account the number of men on whom the test has been checked up, the size of the differences in their scores, and the way the scores vary from the average.

It is only by using this mathematical treatment that we are able to eliminate some of our trial items and include others. If the item we are trying out shows scores that correlate very low with success on the job, we throw it out. If the test scores on any item show a high correlation with job ranking, we include that item in the test. And since each retained item contributes something in the way of measuring some trait necessary for success, we shall find that the scores on all the items combined in the final test will of necessity correlate more highly with job success than will any single item.

The interesting thing is that when the job is all done, we know just how good our test is going to be. If the correlation is high, we have an excellent device for forecasting success on the job. If it is only fair, we have only a fair test. If it is low, we have a test which is probably

worth little for practical application. And if the correlation between test scores is not higher than that between the employment manager's estimates and later success on the job, we are not justified in substituting the test for the personnel man's judgment. The point to be made clear is that it is not a matter of personal opinion on the part of the psychologist. Either he has a test or he has not, and the mathematics of the case are his judge and decide the matter for him.

CHAPTER 6

THE USES OF TESTS

Industrial psychologists abroad are unable to understand why we, after having devised the methods for constructing tests and the techniques for using them, make so little use of them. In some countries on the Continent they have taken over about where we have left off. The large manufacturing and public utility corporations consider it standard practice to select, place, rank, and promote their working forces by test procedures. In a totalitarian state this is much simpler than in a democracy. All they need to do is to say, "Let there be tests," and there are tests, good or bad, and you use them and like them. Here we must demonstrate to each individual plant that the test can be of benefit to it. Unless you can get a hearing, and usually you cannot, this is somewhat difficult, and progress is decidedly slow. Perhaps it is just as well that this is so. Profiting by the experience of the last ten years, we know a great deal more about tests, including both their virtues and their limitations, than we did in the previous decade. Any convert to test technique today has the advantage of being spared the errors of the early experimental stages; at that time we thought that when we finally worked out a set of tests for the Smith Manufacturing Company, we could use it to as good advantage in the Robinson Company in another state and in another line of work. The enthusiasm of the novice and the zeal of the neophyte were responsible for many blunders that set the movement back several years, and that is probably as it should be. In no other field of psychology is it so evident that it is desirable to make haste slowly. Time and experience are the essence of progress in the introduction of tests.

Let us look in a general sort of a way at some of the situations where tests have proved well worth while. The intent here will be rather to indicate the wide range of possibilities than to set forth examples that might shed direct light on your own particular problems. Each situation is a case in its own right and has to be solved as such, but it may be encouraging to see how equally difficult problems have been met elsewhere.

In one university town where the writer was once located, there was a large high-grade department store catering to people who had money to spend for the best merchandise. The employer-employee relations were such that they had no difficulty in attracting the better class of applicants for any job that offered. Their difficulty was that, as compared with other stores in the district, their labor turnover was inordinately high. They found it expensive to hire and train new salespersons continually only to have them quit voluntarily just when they had made good and had become valuable members of the organization, or to discover that in spite of careful training, the salespeople were incapable of handling the type of customer that came into the store. It was bad enough to have to discharge the poor ones, but it was even more discouraging to have the good ones quit.

After several years of this sort of experience the store happened to hear something about tests and went to the university to seek further enlightenment. The psychology department explained, about as we have in the previous chapter, how these things are done and showed them how probable it was that something could be devised to meet the situation, but how impossible it was to make any kind of a guess without the usual preliminary investigation on the job. The store invited them to come in and look the situation over and make their recommendations. This the psychologists consented to do without being any too sanguine of their ability to produce immediate results.

While making their preliminary survey, classifying the salespeople into groups and ranking them as to their desirability from the viewpoint of the management, they filled in the time by administering one of the so-called "intelligence tests," which, at their suggestion, the management required every employee—young and old, novice and expert, successful and unsatisfactory—to take. They were also able to secure the cooperation of many of those who had worked there in the past and had left either voluntarily or by request. Nothing specific was expected of this test, but since intelligence was certainly one of the factors making for success and failure, and since satisfactory tests for this factor were already available, the tests were given as an obvious preliminary. The idea was that the final test would probably have to include some items measuring this factor among many others.

Neither the psychologists nor the store management was prepared for what developed. It was found, when the test results were worked up and correlated with job ranking, that there was a very high correlation between the two when certain arbitrary provisions were complied with. It was found that the successful employees who remained on the job year after year made scores above a certain minimum but definitely below a certain maximum. Those above the arbitrary maximum quit voluntarily. Those below were not able to make the grade and had to be dismissed. Those between had enough of what the job called for to make good at it, but not so much as to find the job beneath their abilities.

So sharp was the division in this case that no further research was necessary. The management was told to administer this twenty-minute test to all applicants and to reject all who scored below a certain level as probably incompetent and all who scored above a certain grade as people who would probably find that the job did not sufficiently challenge their interest and aptitude to make it attractive to them. They could make more money

elsewhere. Applying this single test in this way cut the turnover down to one-third of its old percentage for the next two years.

What subsequent results have been we have not heard since we left the district at that time. The case is interesting, however, as one in which, most unexpectedly, the single item of intelligence as measured by this one test provided a solution for the difficulty. There is no reason to suppose that a similar problem in another organization would be as easily solved as it happened to be here.

A much more interesting example is that of the Philadelphia Electric Company substation operators in which Dr. Morris Viteles of the University of Pennsylvania was asked to determine whether some sort of test program could be set up which would enable the company to cut down on the number of service interruptions resulting from accidents for which the substation operators were responsible. Dr. Viteles followed the usual procedure and procured some truly remarkable results. First, he studied the records of errors for preceding years. From these figures and from the judgments of those who knew the men and their work, he divided the group, numbering more than eighty men, into three classifications, best, average, and poorest. Over a period of nearly three years he found that the average number of errors charged to each man was as follows; for the seventeen men in the "best" group, 0.24 error per man; for the "average" group of 54 men, 0.69 error per man; and for the thirteen men in the "poorest" group, 1.77 errors per man. The average performers made nearly three times as many errors per man as did the best group, and the poorest made over seven times. All these men had had the same training, and in each group were men who had been on the job from one to ten years.

This is a nice example of the sort of problem that arises in the field of the test psychologist. What makes one

man throw the wrong switch in the course of his routine work or fail to act quickly and correctly in time of emergency? Obviously it is not merely a matter of length of service. Some of the poor men had been on the job longer than some of the best men. It is not a matter of chance. Repeated samplings over different periods showed about the same results for the same men. Those who had accidents one year tended to have them the next year in about the same proportion. It is clear that a good many factors must enter into so indefinite thing as predisposition to accidents on a job of this sort; intelligence, memory, attention, muscular skill, emotional stability, and many similar traits are involved. Dr. Viteles recognized it as a complex situation and treated it accordingly. After much painstaking research on the job, he devised a battery of nine tests, each of which he found had some correlation with success on the job. In his checkup on the existing force of men, he found that the three groups scored quite differently. Those who had no errors charged against them scored an average of 70.6; those with one or more errors, 67.9; those with two or more errors, 59.5; whereas those who had three or more averaged 52.2. Plainly here is a battery of tests on which the score made correlates well with excellence on the job. When it is realized that the thirteen operators classed as poorest accounted for 36 per cent of the total number of errors made, whereas the seventeen classed as best were responsible for only about 6 per cent of the total, it will be seen that any test which would make it possible to avoid hiring men like these thirteen poorest ones would be worth while. As a matter of fact, if the test had been in use and had been relied on for the hiring of the eighty-four men, only one of these poor performers would have been hired, whereas twelve of the seventeen good ones would have shown excellence on the test. It must be remembered that these were men who had been hired by the old system and had been able to hold their jobs. The results would have been

even more striking if the group of those who had been fired for incompetence had been included.

Having shown thus conclusively that the test was able to distinguish between the good men and the poor ones, it was put in operation for the purpose of selecting applicants as well as for assigning present employees to jobs suitable to their capabilities as shown by the scores, the good men being placed in the most difficult situations in the larger substations. As a result the errors were cut to a third of what they had averaged for the three years just prior to the introduction of the tests. This was accomplished within a year after their inauguration. By the fourth year the system had had time to take effect in a large way, and for the first half of that year, the most recent figures available at this time, there had been only one error. This is an excellent example of what can be done in a difficult situation when the proper methods of test construction and evaluation are followed.

A still more elaborate test program, which has stood the trial of more than a decade, is that of the Scoville Manufacturing Company of Waterbury, Connecticut. This was introduced by Dr. Millicent Pond after months of careful preliminary study and has been supervised and improved by her over the entire period of its use. The test which Dr. Pond finally evolved for use at this plant has been found applicable to a wide range of office and factory positions and jobs. At last accounts it was being used successfully for hiring and placement at all levels from yard laborer and apprentice to draftsmen and salesmen. The test consists of eight parts, five of which can be given to men or women who do not understand a word of the language spoken by the administrator. The three other parts involve a knowledge of English. Somewhat better results are obtainable with the whole test, but quite comparable scores result from the use of only the non-language portion.

The test has now been administered to something over ten thousand men and women and is one of the best standardized in the industrial field. It is now possible to compare the score that any applicant may make on the test with the scores of those whose work on the job the company has had ample opportunity to evaluate. As a result of the accumulation of these scores, the employment department is able to forecast probable success or failure at various levels in the plant. In other words, an inspection of the score made by an applicant makes it possible to set an upper and a lower limit to the jobs which the applicant could probably fill satisfactorily. There is considerable overlapping of scores made by those holding jobs of approximately the same degree of difficulty, so that after the test has been scored, there remain several possibilities for the placement of the applicant in jobs within his range of attainment. Other factors than the test results determine which of these jobs he would be assigned to, experience, personal preference, personality, physique, nationality, etc.

That the test makes a better job of preventing misfits than did the old interview method is shown by a comparison of figures covering periods of several years under both systems. Consider the single item of toolmaking apprentices as a sample of the utility of the test technique. Over a period of about seven years, in which 163 applicants for this job were hired by interview only, it was found that 61 per cent of those taken on proved satisfactory. During the next five years, when the interview was supplemented by the use of the Pond test, 155 were hired and 83 per cent were found satisfactory on the job. During the next seven years the interview and the Pond test were reinforced by two other tests which had been developed elsewhere. The 147 applicants hired during these years were found to be 93 per cent satisfactory as judged by the same standards as before.

When numbers of this magnitude are recorded over periods as long as these, the possibility that the results are due to chance disappears and one is compelled to attribute the improvement to the introduction of the test program. Since approximately the same results were obtained in all sixty-five occupational groups to which it has been applied at this plant, there seems to be little room for doubt that the test program has been a worth-while improvement over the old system.

One significant item in the account of the experience at Scoville as we have given it above should not be overlooked. We have given the degree of success obtained by "interview only" and by "interview plus test." In no test program with which we are familiar has it been proposed to do away with the interview entirely and to place sole responsibility on tests. The test is to serve as an aid to the personnel department and to the supervisor. Its function is often that of a secondary filter for those who have already been passed upon by the usual personnel department methods. Under such circumstances the personnel manager interviews all applicants and accepts provisionally such as seem to meet his requirements. In some plants these men are then given a physical examination and such as pass this are given the psychological test. This was the procedure at the Philadelphia Electric, where a passing grade of 75 was required. More than two-thirds of those who had been passed by the personnel department and by the examining physician failed to make this grade on the psychological test and were rejected.

In other plants the process is exactly reversed. All applicants are first given the psychological test, then the medical, and finally are sent to the personnel department for final approval or rejection. Since the majority of applicants fail to make satisfactory scores on the test, and since some of those who do pass are thrown out on physical lacks, the work of the interviewer is greatly reduced and can thus be done less perfunctorily, and each case can be

given more time and more careful and intelligent scrutiny. Since the testing can be done in groups but the interviewing must be individual, this order of procedure has much to recommend it.

In many situations in which it has long been customary to make selection on the basis of a comprehensive written examination, as for the various branches of the civil service and for college entrance, the substitution of aptitude tests has proved both more efficient and more economical. In the case of United States mail distributors, for example, substituting for the old Civil Service Examination a new psychological test, consisting of three parts—a sorting test, a memory test, and a test of following directions—made possible the selection of men 93 per cent of whom were above the average of those selected by the old examination. An additional advantage is that the test can be scored and handled in approximately half the time required by the examination which it replaced. When it is considered that from 60,000 to 80,000 applicants must be examined each year for jobs as postal clerks in the post offices and on trains, some idea of the saving can be formed. When to this is added the virtue of much better selection on the basis of ability, the case for the psychological test is well established. In the same way it has been found that aptitude tests will forecast success in college more precisely than does the old-fashioned comprehensive examination, in which an attempt was made to find out how much of the subject matter of his grammar school and high school courses the applicant retained at the moment of his application for entrance to the college.

It is not only for purposes of acceptance of applicants that the modern test techniques are proving useful. They may also be used as guides in selection for promotion in the case of old employees. An interesting problem covering both of these functions is undergoing careful study at the present time in one of the large banking institutions in an Eastern city. This bank has many

suburban branches, all of which are equipped with the latest laborsaving business machines. Because of this mechanization of the accounting features, it has been found possible to employ a much lower grade of help as tellers and clerks. About all that has been required is a pleasant approach, an ability to call many customers by name, and a fair ability to count money quickly and with few errors. This has resulted in a pleasing decrease in the size of the pay roll, since employees of this level can be secured for less money in the pay envelope. To such young men and women the prestige of working in a bank is a partial substitute for pay.

For a time this pay-roll economy was a source of considerable satisfaction to the management, but the time arrived when it became necessary to select from among the employees someone for the position of branch manager or credit manager, or some other position, in which judgment and a broader knowledge and ability were required. Much to their embarrassment and inconvenience they then found that they had no suitable material in the ranks from which to make the promotion. It was desirable to advance one of the tellers who knew the people of that suburb, the proprietors of the local stores, their standing in the community and the character of their business, but the man for the job was not available. They have now undertaken to remedy the situation by inaugurating a thoroughgoing test program, first, to find out what it takes to fill each of the jobs from typist to manager, and, second, to make sure, by subjecting all future applicants to test, that they now hire at least enough promotable material so that they will never again be caught in such a situation.

Another promotional problem for which test techniques provide a solution superior to that afforded by the usual method is worth mentioning because it is representative of one of the headache causers which management finds itself up against time after time. In a certain large

organization there are many men doing exactly the same kind of work at each level of activity. For example, there might be 200 men engaged as stockkeepers whose business it is to see that a certain section of the warehouse is kept supplied with each of a thousand and one items from any or all of which daily shipments may be made in large or small quantities. It is an active, though somewhat routine, type of work. On each bin is a card stating what the full quota should be, at what point below that amount a reorder notice should be sent to the main office, and at what minimum point an emergency notice should be sent in. At the level above the stockkeepers are the men to whom these notices are sent, the buyers or reorder men. There are possibly sixty of these men, each with his list of specialties, and it is their duty to see that shipments from contractors come along without delay so that the stock may be replenished before the critical minimum point is reached. They must also make commitments on the basis of last year's or last month's records for the supply of merchandise for next season in such quantities as will meet the needs of the market at that time and at a price that will be competitive and profitable. The job requires an alert and comprehensive grasp of present rate of sales, immediate seasonal variations, long-time trends, and probable causes of variation in this trend.

The supervisor of one division of these stockkeepers put this problem up to the management for a ruling as to policy. He had two men in his department who had been classmates in high school and had come to work for him on the same day some four years previously. As to personality there was nothing to choose between them. Even in the matter of what might be called general intelligence, as judged by their daily behavior, the supervisor felt that it was even Steven. There was a difference, however. One of the men was doing an extraordinarily fine job of stockkeeping and seemed to be doing it easily. He spent his spare time in wholesome recreation and social

activities but could be relied upon to turn up each day on time, alert and ready for a hard and efficient day's work. The other man was doing a perfectly satisfactory job with his stockkeeping, somewhat above the average but not such an outstanding performance as the other man turned out. But for the entire four years he had been attending night classes at a nearby university taking courses in their school of business to prepare himself for the next step, promotion to the rank of reorder man. Such a vacancy was now available, and one of these men would logically be promoted into it. Which should it be? If he gave it to the man who was working six nights a week at his schooling, he would be passing over the man who was doing what he called a "bang up job" of the work to which he had been assigned and so placing a discount on that trait. If he promoted the man who did well what he had to do, he would be discouraging others from putting in their spare time to prepare themselves for promotion to greater responsibilities.

The question caused much debate among the supervisors who seemed to favor the two men about fifty-fifty. The management decided immediately in favor of the man who was doing the outstanding job where he was, the argument in his favor being that he would carry this quality over into his new job and do a bang up job there also. No allowance was to be made for the possibility that the man who was studying nights might be using up enough of his surplus energy so that he was not able to put in such strenuous efforts as the other man on the job itself; or, if this item was considered, it was believed that the job in hand comes first and only surplus energy should be devoted to forward-looking self-improvement.

The interesting point in the discussion, which lasted some weeks, was, to the writer at least, that none of the supervisors and no one in the managerial offices brought out the fact that neither of the men had demonstrated anything that had any bearing on his fitness for the new job.

Stockkeeping is a routine job with all the rules laid down for rigid following. The reorder job called for aptitude for quick decisions, comprehensive grasp of many factors, and the exercise of good judgment on which much might depend. Going to night school is commendable and, if the student has certain other traits, might be of considerable assistance to him if he were promoted. But going to night school is also somewhat of a routine job. A man may attend classes regularly and obtain from the professor excellent grades in his work and yet utterly lack many of the essential qualities for success in the job in question. On the other hand the habit of doing a fine job as stockkeeper might depend on just the qualities which would unfit a man for the entirely different job of buyer. Thus they were attempting to determine which of two characteristics should be rewarded above the other when neither had much, if any, bearing on the situation. And this is the problem commonly met by supervisors in every plant in the country, which may be one reason why so many promotions do not work out as it is hoped they will.

Clearly this is a case where an objective test is called for. Utilizing the methods we have described, a set of tests should have been devised which would differentiate between those who have what it takes to be a good reorder man and those who do not. The test, having been carefully constructed and checked and rechecked to make sure that it was statistically sound in its measure of significant differences, should then have been given to the two men in question—and to all the other stockkeepers eligible, whether they were doing a bang up job or were attending night classes or not. What should determine the promotion is probability of success on the new job, and while performance on the old job may mark a man as an eligible prospect, it is not sufficient by itself to warrant its being relied upon as the sole criterion of fitness for the promotion.

CHAPTER 7

PERSONALITY

Personality is such an indefinite thing that no two people, even among the psychologists, seem to agree as to just what they mean by the term. To distinguish between personality, character, and temperament, let us set up definitions of our own and then forget all about the distinctions between them and discuss them all under the single caption of personality. Let us say that character is that constellation of traits which a person possesses for better or for worse which make him an individual. The possession of this character causes the individual to act in certain ways, doing certain things and avoiding others succeeding in certain endeavors and failing in others. We rarely have a true knowledge of our own characters and probably never arrive at a true estimation of the character of others. Nevertheless, because of their characters, they make various impressions on those with whom they come in contact. (No two people affect us the same way, and we affect no two people exactly the same. We judge others by the way they appear, by their pattern of response to the world about them, including the people in their environment.

This external dress which each of us adopts consciously or unconsciously in meeting life's situations we shall call "personality." It may or may not tally with character, although it is based upon character. A man suffering from deeply ingrained feelings of inferiority may adopt the manners and mechanisms of the aggressive, argumentative, and conceited bully. Here character and personality are direct opposites, but it is the personality and not the character that we judge him by and that determines our

reactions to him when we are thrown into contact with him. This distinction between two elements is not a scientific one, nor is it universally accepted. In fact, some psychologists reverse the two definitions and call personality the true inwardness of the man. What names we apply to the two factors are not important, but it is important to realize that there is a difference between them.)

Temperament is the product of prevailing moods, and moods are sustained patterns of emotional reaction habits. There is no substantial dividing line in any of these classifications. We speak of a person as having a gloomy or pessimistic personality, and we mean that in general he can be depended upon to take the gloomy view of things past, present, and future. His prevailing mood is one of pessimism. There may be a hundred different kinds of personality designations in common use, but it is interesting to note that the names we give to most of them are the names of the emotions or the behaviors resulting from the emotions: cheery, hopeful, despondent, optimistic, sour, suspicious, stable, aggressive, submissive—all based on moods and feelings.

Whether we use one set of terms or another to name these things our chief interest is in the underlying factors that make people different one from another, inwardly and outwardly. In Chaps. 3 and 4 we considered the two main divisions of these factors—habits and aptitudes. By the time we have arrived at adult ages we are the product of these two elements, the equipment we were born with and the things we have learned. Heredity sets our limits but environment, life's experiences day by day, determines what use we make of the equipment we have, the degree to which we develop the aptitudes with which we are born. Only when we grasp this fact can we begin to understand why there are so many different kinds of people, why, in fact, there can be no two personalities exactly alike. To begin with, no two persons, with the rare

exception of identical twins, have exactly the same inheritance, not even children of the same parents. Nobody knows how many factors enter into our inheritance to determine our bodily structure, our glandular constitution, our intelligence or any of the other qualities which make one newborn infant different from another in appearance and in capacity for development. Certainly there are hundreds of thousands, perhaps millions, of combinations of factors. And from birth to maturity no two of us have even an approximation to the same experiences. Since every experience leaves its trace in the development of the organism, whether the trace is large or small, insignificant or important, and since these experiences run into the millions, and since we are the product of the inheritance and the totality of the experiences, we can see how impossible it would be ever to find one personality an exact duplicate of any other. To complicate the situation further, it is not a question of mere presence or absence of certain traits, but the degree in which the traits are possessed and the way in which they are aggregated as combinations or constellations. Literally infinite in number and variety as these combinations are, we have learned to accept the total end product as merely that which distinguishes one person from another and to make little attempt to determine the factors that account for the personality of any given individual.

In the light of the multiplicity of factors entering into the making of a personality, it is not to be expected that even the most fortunate person will find that all of the component elements will fit together into one harmonious whole, each trait supplementing and strengthening the others as the structural members of a cantilever bridge combine to make the span across the river one integrated creation, no part being superfluous, each part carrying its portion of the load, and none neutralizing or destroying the useful function of any other. Bridges are made by design and calculation. Personalities are made by chance.

The material which goes into the parts of the bridge can be controlled as to its composition and proportioned as to size so as to be adequate to the duty it is to perform. The components of personality can be controlled neither as to quality nor as to quantity. Under such circumstances it is not to be wondered at that many of the traits which are inherited or acquired in these unpredictable ways not only do not dovetail into each other in such a way as to produce perfect harmony, but often are found to be directly antagonistic. Thus we may observe a man who in early childhood acquired an intense fear of dogs, which he has never since overcome, now married to a woman who is passionately fond of cocker spaniels and who insists on having them around the house. Although the man's chief desire in life may be to make his wife happy and he may argue himself into the belief that his fear and dislike of dogs are unreasonable, as they are, the fact will remain that he has two strong, and strongly incompatible, motives to action, both of which cannot easily be satisfied at the same time. This is an example of what is called a *conflict situation*. None of us is entirely free from such conflicts.

To have factors of personality which are in conflict is the normal lot of man, and always has been. In most cases the motives in conflict are not of vital importance in our lives and the struggle between them for dominance in our behavior is relatively insignificant. In others the antagonistic motives are of primary significance, and the conflict may be intense enough to destroy all peace of mind and emotional stability in the individual harboring them. Sometimes these conflicts are between physical factors, like the restless energy that craves expression in activity which cannot be indulged in because of a structurally weak heart which will not stand the strain. Sometimes the conflict is between incompatible emotions as in the case we have imagined for the man with the fear of dogs. Or conflict may arise because of inability to reconcile two sets of ideals. These are in the realm of our

verbal habits. One may have learned through instruction in school and home that patriotism is admirable, that it demands that a man be ready at all times to fight in defense of his homeland. But he may also learn that in the eyes of God it is sinful to take the life of a fellow man. The two ideals cannot both be lived up to and conflict is inevitable. Or we may have conflict between verbal ideals and fundamental emotions, or between ideals and such physical factors as lack of muscular strength.

Psychologically and in the final analysis, however, all conflicts are matters of the emotions. In the last case mentioned above, for example, the man whose ideals impel him to deeds of heroism but whose physical weakness prevents him from living up to his ideals really is torn between conflicting desires, the desire to perform the deed and the desire to avoid pain or death which might be entailed by the act. Conflicts are disturbing only when the two opposing motives impel us with about equal force and in opposite directions. When either motive becomes so strong as to completely outweigh the other, the conflict is dissipated and we act without serious distress in accordance with the stronger drive. Conflict arises from the difficulty of making a choice, and making a choice is difficult only when the two alternatives are equally attractive or equally repellent. In fact, if both are of the same potency, no choice can be made, choice being merely a response to that one of the pair of alternatives which at the moment appears to outweigh the other with sufficient margin of difference to bring action.

If our lives are not to be completely disrupted by continual emotional stress our conflicts must be met and disposed of in some way that will be satisfactory at least for a time. Customarily we resort in these situations to one of three methods for the solution of the difficulty. We may dispose of it after a fashion by compromise, by avoidance of making any choice at all, or by choosing one or the other alternative and then bolstering up our

decision by finding false though rather satisfying reasons why the choice was proper. None of these methods really solves the predicament. The conflicting motives remain just as they were, like two armies facing each other across no man's land when no actual fighting is in progress. The only real solution, of course, is to get rid of one of the emotional habits, or at least so nearly rid of it that it becomes too weak a tendency to offer any sort of disturbing conflict with the opposing emotion. It sounds simple and it is, but a good many simple things are difficult, and this is one of them. We shall have more to say in the final chapter about how to go about disposing of emotional habits that we find it no longer profitable to retain.

Sometimes these emotional habits are not only strong enough to influence much of our behavior but have their origin in the realm of events long forgotten. When such is the case, we commonly refer to them as "complexes," a word that has come into general use with the popularizing of the Freudian doctrine of psychoanalysis. Unfortunately, perhaps, the general public has not only taken over some of Freud's catchy phrases and well-coined words, but it has also uncritically adopted many of his explanatory mechanisms and psychological devices which the laboratory psychologist is inclined to look upon with some doubt and misgivings, not to say scepticism and disbelief. The world owes much to Freud for his stressing of the importance of the events of early childhood in the shaping of the personality through life.

Perhaps this item on the credit side of the book is partly balanced by the debit charged against him for having made the world believe strongly in the mystic potency of some sort of a subconscious mind which, like the iceberg, is nine-tenths below the surface, the one-tenth above the surface being the "conscious mind" with which you meet the problems of schoolroom and office and shop, which you use in planning your vacation, balancing your checkbook, or deciding to buy a car on time payments. This proved to be

quite a convenient device for Dr. Freud. Everything which could be easily accounted for was the product of the workings of the conscious mind, whereas everything whose origin was not so clear was generated in this vast "subconscious," which was said to contain all the imps and devils of behavior inherited from our caveman ancestors and on back to the days when the race had not risen above the animalcules that inhabited the primeval sludge. The subconscious thus became a sort of psychological catchall where one could throw all the items that did not fit into the orderly harmony of an ideally integrated personality. The greatest trouble with the explanation is that no one has been able to find any scientific evidence for the existence of anything resembling this demon-directed subconscious mentality.

To the practical American psychologist it seems wholly unnecessary to create this imaginary submerged mystery, especially since an understanding of the way human habits are formed provides a more logical and satisfactory explanation. The Freudians define their "complexes" as a constellation of ideas tied up with a strong emotion, the whole unsavory bundle having been rejected by the conscious mind and shoved down into the unconscious much as one wraps up decaying fruit in a newspaper and deposits it in the garbage can. Always there is the emotional content playing a prominent part and always the whole thing is suppressed or there is no complex. However, if we regard the whole emotional system of nerves, secondary nerve centers, glands, and viscera as capable of forming habits just as the muscles form habits, and if we realize that these emotional habits remain and continue to function unless corrected or eliminated, just as our muscles take on a habit in the signing of our name, we have a mechanism which accounts for what we observe without having to leave the realm of physics and chemistry. As well assume a subconscious mind for the road map which directs it to tend to fold up again and again along the creases that the

mapmaker originally imposed upon the paper when the map was new.

We have said that we all have conflicts; that some of the conflicts are of no moment, whereas others are of sufficient importance to interfere with our happiness and efficiency; and that there are three common ways of meeting the conflict situation, namely, by compromise, by avoidance, and by a choice-and-justification technique. Let us consider the three ways in this order.

To make the case concrete, let us assume that we have been asked to give advice to the man who fears and hates dogs, but who has a wife who is a dog fancier and two cocker spaniels as members of his household. What can he do about it? He can say to his wife, "O.K., keep your dogs and let them climb all over you while I am not home; feed them at the lunchtable and take them out for walks during the day. But fence off a place in the backyard and keep them there during the time I am home." He may admit it is unreasonable, but he will take refuge in the statement, "That is the way I am and I can't help it." Some wives who care more for their husbands than they do for dogs would agree to this with what grace they could muster, and things in that household might go along without serious friction.

This is the compromise method by which he keeps both of his emotional habits alive, but tries to keep them separated. It is not only possible to accomplish this adjustment, it is probably the commonest of all the solutions. We would not recommend it to the man because no matter how much affection he and his wife have for each other, there is always present this potential source of trouble. No wife likes being told what she can and cannot do in her own house, and sooner or later she is sure to make an issue of the matter, or when friction arises from some other cause, he is going to demand that the dogs be evicted from the premises entirely—"Choose between your dogs and me!" It is a good deal like living on the slopes of a volcano.

It can be done, but insurance companies do not care to cover the risk.

If this compromise method is not possible or does not appeal to either or both of the parties at interest as a desirable solution, the alternative method of avoidance can be resorted to. If the wife refrains from keeping dogs, the conflict over them disappears. Or the husband can let her keep the dogs, but have some other man for a husband. Either of these two methods separates the man and the dogs and the conflict is solved by avoidance. Effective as this may be so far as the dog situation is concerned, we would not like to recommend it unless the dogs are very valuable and the husband is not. There are situations in which dogs are preferable to husbands, at least from the wife's viewpoint. Since we are not being asked to solve the wife's problem, we would not be justified in recommending this solution as an aid to the husband. However, this is a common means of meeting marital conflicts, especially in Hollywood, as shown by the statistics on divorce as of 1940. Meeting a conflict situation by running away from it is very much the fashion of the times.

There remains the possibility of solving the dilemma by making a definite choice of one of the emotions and attempting to ignore or suppress the other. If we recommend this system, we shall tell the man to reinforce in his own mind, in as many ways as possible, the importance to him of ensuring his wife's happiness and of maintaining a happy home life. At the same time he must strive to weaken the tendency to be irritated by the dogs. He must stress to himself the fact that after all is said and done, it is no more of a crime to love dogs than it is to dislike them, that all married life is a compromise of give and take between personalities; that his wife overlooks as many failings in him as he overlooks in her. To be happy though married, one must have unity in the essentials, liberty in the nonessentials, and charity in all things and cocker spaniels are not among the essentials, either because of

their presence or because of their absence. By this sort of treatment of his own emotional life he may so strengthen the notion of the desirability of living happily with this wife and may so weaken the effect of the undesirable animals on his peace of mind that in time the emotional reaction against the dogs may largely disappear and be swallowed up in the greater emotion lavished upon the wife. This solution is much less common because it requires a more prolonged effort and a more unselfish readiness to exalt the happiness of another above our own deep-rooted desires than most of us are equipped to bring to bear on the situation. It savors of the peace-at-any-price attitude, and although it may dispose of the dog problem, it may generate many others through building up a one-sided relation in which the wife learns to expect the same self-effacing consideration on the part of her husband on many another point of difference. In any event, it must be recognized that the emphasis that is consciously added to the emotion toward the wife has in no way reduced the dislike for dogs. Although this dislike is now no longer permitted to come between husband and wife, its continued existence and the effort to keep it submerged are a source of emotional tension that may show up as increased irritability in many things in no way connected with the dog problem. The adjustment is more seeming than real.

The only thoroughgoing and effective solution of the conflict is, then, the unusual one of removing the undesirable emotion itself. It is not so uncommon for the desirable emotion to evaporate by itself under these conditions. The man may lose his love for his wife by learning to think of her as selfish and unreasonable. He may persuade himself that she is not the woman he thought she was and so absolve himself from the vows that he gave to the woman who now seems to be really nonexistent. But we are advising our patient, or client, on means of solving his difficulty with the greatest happiness to all concerned, so we endeavor

to show him that it is possible to overcome the dislike for dogs. After all, other people as intelligent and as particular as he, with as good a line of ancestry behind them, do like dogs, and so it is neither impossible nor unreasonable to think that this man might learn to like them. The greatest barrier to accomplishing this is the man's unwillingness to make the attempt. His first reaction will be like that of the boy who said, "I will not eat spinach; if I did I might like it—and I hate it."

But suppose we have brought him to the point of being willing to try the experiment. The first thing we shall need to do is to show him how he acquired the fear in the first place. We shall need to explain that it is *acquired* and not something that he was born with. We shall need to relate case after case in which similar fears have been learned early in life and retained for decades, although the actual events that caused them have long been forgotten. When we have explained the mechanisms to him and persuaded him of their possibility, or even of their probability, we shall endeavor to go one step further and show him when and where and how he himself had an experience that fixed the emotional habit upon him, perhaps when he was very young. He may be able to remember the event himself. If not, we may be able to secure an account of it from other members of his family or from older friends of the family who recall that he was attacked by a large dog when he was too young to know what it was all about. This step in the proceedings is not absolutely essential, but it is a great help since it demonstrates that the condition had a cause and that it was no fault of his, but that, definitely it was *learned*. Once this fact is acknowledged, it is a simple matter to show that if that habit was learned, a new one can now be learned to take its place. If he once learned to dislike dogs, he can now learn to like them, and since he cannot both like and dislike at the same time, the dislike will disappear as the liking develops.

In getting rid of an old and undesirable habit, we do not need to concern ourselves with this troublesome cause of our discomfort. All we need to do is to concentrate on the learning of a new and countervailing habit. The new habit will, of necessity, drive out the old if they are incompatible.

We should be careful to caution our patient about one feature of the relearning. He must relearn slowly and by imperceptible degrees, starting from a long way off and approaching the goal with caution, and being careful at no time to make so sudden an approach as to arouse the old feeling. The problem we face is this: Dogs now arouse fear; we want to alter the situation so that dogs arouse confidence and fearless affection. This might be done by an extensive study of dog lore and of dog culture. If the course of reading is carefully prescribed and intelligently followed, a mild interest in dogs and dog nature will be aroused, the dogs themselves being kept out of the picture at this stage of the proceedings to prevent reinforcing the dislike while the interest is yet feeble and ill rooted. The interest can be nurtured into an understanding, and that into a well-grounded knowledge of the peculiarities of the different breeds. Knowledge and interest interact, and each increases the other. There is no need for haste in the matter, and in time intellectual curiosity is aroused and dogs as a class of animals—and later a dog as an individual—become objects of interest rather than inspirers of fear.

The problem may also be approached from a different angle. Even though a man may have a fear of full-grown dogs, he does not include in the category of dogs the little helpless newborn puppies. Almost any person likes to watch puppies at play. Let such a man become interested in a puppy, let him feed it and teach it manners and tricks, and let him keep it in his environment as it grows up, and the chances are strong that he will never have the fear reaction aroused by that particular animal for there is no one day on which the puppy ceases to be a puppy and

becomes a dog. The change from infancy to maturity is so slow that the increasing interest, pride, and affection for the little creature more than keep pace with the growth. And from the one dog the altered attitude spreads to other dogs and finally to all dogs. In either procedure we have replaced an undesired reaction by acquiring a new and desirable one diametrically opposed to it.

This is not merely a theoretical or academic prescription. It is one that has been used in many clinical cases for a great variety of emotional disturbances and with such a high percentage of success that it has become more or less standard practice. After all, it is merely following out the process that life itself has shown us to be efficacious. We call it "out-growing our childish fears." Actually, it is the product of just such a slow relearning through the natural experiences of life wherein we are exposed, as the years go by, to innumerable instances where the fear response is not aroused until finally it fades out of the picture to be replaced by one of confident trust or affection. Thus the child who fears all strangers in time becomes a sociable being by the mere process of meeting many of them who do him no harm and who, on the contrary, may become welcomed for bringing candy, or toys, or just an all-round good time.

So much, then, for our little fiction that we have been considering the case of a man with a fear of dogs. In reality, we have been speaking to the reader himself. That immediately puts a different face on the matter. It is easier to see that a man with a fear of dogs can do something about it than it is to admit that we ourselves can do something about that emotional defect of our own which we dimly recognize but refuse to admit has made us so much trouble in the past that at times it has even jeopardized our success in the work we are trying to do in life. Perhaps it is a high temper that causes us to fly off the handle when things go wrong on the job. Perhaps it is a feeling of inferiority that makes us hesitate to tackle a new

job or makes us oversubmissive and deferential in the presence of the boss, too much of a yes man. Whatever it is, if we have been assuming that, since that is the way we are constructed, there is nothing we can do about it but become reconciled to it, we have merely been giving ourselves a psychological sedative which dulls the pain but does nothing toward removing the cause. As soon as we admit that the defect is something we have learned and that we can unlearn it by the same process, it puts the responsibility for doing something about it directly where it belongs—on our own shoulders. But of this I shall have more to say in the final chapter. It is sufficient now to point out that this is the way in which most personalities have developed, by the chance happenings of life, but that there is no reason to continue to leave the development of our own personalities to the same sort of chance from now on. Personalities can be designed and built just as cantilever bridges can.

CHAPTER 8

RESISTANCE TO CHANGE

Complacency, the feeling that all's right with the world, especially with us, is a comfortable feeling. Just so long as we retain our feeling of complacency, we shall remain fairly inactive. It is when we fear that this comfortable state of affairs may be upset that we go into action. Or, if it has already been upset, we act to restore it. It is doubtful whether we ever do anything at any time except to prevent our complacency from being disturbed or to recover it if it has been disrupted. This morning I was lying half awake when I heard my wife get up about seven o'clock. I could hear these sounds—hear her taking her shower and hear her dressing—and still retain my complacency. I could hear her go down the stairs to start to get breakfast and still be complacent. I dimly heard the sounds of preparation without being aroused to action, but then I heard the zing of the vacuum cleaner, and I knew I was overstepping the limits of fair play and my complacency was threatened. I remembered that the house painter was expected at eight, and I lost some more complacency. My stomach muscles began to contract and relax, which is what happens inside of you when you say you are hungry. My complacency was gone and I got up.

Unless what you read in the previous chapter disturbed your complacency, the chances are very slight that you will do anything about improving your personality. It is such a common habit to be complacent about our own defects that it might almost be classed as an "instinct," the instinct of self-satisfaction. You may not think it is true of yourself, but you will have to admit that it is characteristic of everybody else. And it is just as true of the situ-

ations imposed by our environment as it is of those which are more directly within ourselves. We do not act to change the conditions about us until they begin to disturb our complacency. I do not cut the grass until I begin to feel that to put it off any longer will make it harder to do later, or until I begin to compare my lawn with the nicely sheared plot of my next door neighbor. I do not pack up and move to California until I begin to fear for my continued prosperity or my health in the state where I live. If things run along in a comfortable sort of a way, I remain where I happen to be. I do not bother to go to the polls to cast a vote until I become disturbed over the evidence that the New Deal is ruining the country and that my own job may be affected if things keep on as they are going—or until I am persuaded that unless we rally to the support of the New Deal, the old reactionary Tories will regain the direction of affairs and we shall lose all that the New Deal has painfully gained for us in the last seven years. You continue to wear the expensive and uncomfortable clothes that happen to be in style in your generation because to do otherwise would mark you as a freak, and to be considered a freak disturbs your complacency. So we go on from day to day, from month to month, from year to year, in the same old groove of habits because we have become so adjusted to them that to do otherwise would upset our routine and with it that comfortable feeling of satisfaction with things as they are.

On this common human quality are based the national or racial customs which make the peoples of one land differ from those of another. And on these in turn are based the misunderstandings and the wars that have made history. For customs are merely the products of the combined complacencies of many people living generation after generation in the same place and under much the same conditions and complacently doing nothing to change their ways, their beliefs and opinions, or their environment. I lived in Philadelphia in the 1890's. It was "corrupt and

contented" then, and I find it unchanged when I return in the middle 1930's. And Maine and Vermont still vote Republican. Custom is the flywheel of civilization. Without mass complacency the world over, we should have no stability anywhere. We would be democracies today, totalitarians tomorrow, monarchies next week, and communists the week following. A flywheel is used in mechanical devices because it requires considerable energy to make it change its speed—energy applied to it to make it increase its rate and "stored" energy removed from it to make it slow down. The flywheel acts as it does because of its inertia. Inertia is that quality of matter by which it remains in motion in the same straight line or remains at rest until it is acted upon by some external force. The customs of a people have inertia.

The principle of the flywheel with its "tendency" to "resist" having its axis of rotation changed has been put to an interesting use. The gyroscope, which is used as a stabilizer to reduce rolling and pitching in battleships and ocean liners and on airplanes, is merely a heavy flywheel rotating at as high a speed as is safe in relation to the strength of the material from which it is made. One of the larger gyroscopes takes hours to bring up to speed and it will continue to spin hours after the steam which propels it has been shut off, but while it is spinning it takes the application of considerable force to tilt it out of the plane in which it is turning. Most of us have seen the little gyroscopic tops sold at county fairs. They are small disks of heavy metal mounted on a spindle which is set in a circular frame and given a high speed of rotation by pulling on a string which has previously been wound about the spindle for the purpose. Set going, they can be placed on a pedestal at almost any angle and remain at that slant apparently defying gravity until they begin to slow down. It is interesting to hold this little toy in the hand and feel how it seems to resist being tipped this way and that. In fact, it is possible to destroy the top by

making this change too abruptly. The spindle will be forced out of its bearings in the frame, or the disk itself will be warped out of shape. By a gentle pressure, however, the axis may be tipped slowly through any angle without damage and without much appreciable resistance. This is true of the large ship models weighing several tons, and this factor has to be taken into consideration in their design. Even so, they can be wrecked, with disastrous consequences, if the axis of rotation is tipped too suddenly.

Much the same effect is experienced in the attempt to alter the course of a well-established custom, either in a nation or in an individual. The time taken to bring about a change is an extremely important item. This has been well illustrated in the experiences of the New Deal in Washington. We have for several generations been accustomed to regard that government as best which least interfered with the conduct of the affairs of the individual, the local community, the city, the county, or the state. As population increased and as units of business and industry and transportation multiplied in number, size, and power, a gradual alteration in the scope of the functions of the national government began to take place two generations ago but it was so gradual that no general trend was apparent and little resistance was evoked. We do not realize today that the Interstate Commerce Commission was established over fifty years ago. The Sherman Anti-Trust Law was passed in 1890, and federal troops were used in control of labor troubles four years later. Within another decade the government was digging the Panama Canal. In 1911 the Standard Oil Company was broken up and the great trust-busting era was in full swing. During the World War many units of centralized control were set up which remained unnoticed after the crisis had passed. Little or no public concern was expressed over this evident trend toward greater and greater centralization of power because the change was gradual and was spread over a quarter of a century. A central bureau-

cratic government was well on its way toward permanency long before 1933. But because, with the advent of the New Deal, changes in a similar direction came with great rapidity, we have seen a high degree of resistance. The error lies not so much in the nature of the change attempted as in the speed with which it was brought about. Our complacency was not disturbed by an I.C.C. in 1887, but it was by the multitude of other alphabetical agencies sprung on us all at once fifty years later. The gyroscope may be shifted, but it cannot be yanked into a changed position.

We are witnessing a still more drastic attempt to run counter to this gyroscopic action of public custom in the Germany of today. Anyone who has a fair comprehension of this power of resistance could tell Adolf Hitler that what he is attempting to do to the German people cannot be done in one decade, nor in one generation. Religions have immense capacity to resist sudden changes. Hitler may issue edicts suppressing Judaism, Catholicism, and Lutheranism and setting up in their place the worship of the old pagan gods, but however long he may retain dictatorial powers, however long he may keep the outward expression of these beliefs under the ban, Judaism, Catholicism, and Lutheranism will be there in Germany and functioning as of old centuries after Hitler has become history.

The Russian revolutionists knew better than to try to convert a nation to a new way of life. They had read the histories of the radical revolutions of the past and had observed that within a few short years after the new regime was inaugurated the old order was back in full force and things were as they had been before the revolution was staged. They knew that a people brought up under the iron rule of an autocratic Czar cannot be switched over to a system in which the emphasis is on the individual, the ultra-democracy of the commune. They made no such attempt. Instead they set up a dictatorship to last for twenty years during which they undertook to train up the oncoming generations who were not old enough to have

known the Czar and his ways. They knew that the resistance to change would be so dominant a trait in the older people that it would be a hopeless task to attempt to overcome it in the time at their disposal. They extended a not too cordial invitation to the oldsters to join the movement, but it was little more than a gesture. No one will ever know how many of this older generation who could not accomplish the shift in their axis were, as they termed it, "liquidated," but it ran into the millions. Meantime, with all power in their hands, the revolutionists instilled new ideas into the minds of the children and youths, ideas of freedom from affiliation with any organized religion, ideas that the sole virtue consisted in living and working for the good of the community, ideas of production for use rather than for profit, ideas of scorn and contempt for all other forms of political economy and government. They believed that at the end of twenty years they would have raised a generation of men and women between twenty and thirty who would be old enough to take over the reins of government and put into operation the ideals of communism in which they had been meanwhile thoroughly steeped. The dictatorship would have done its allotted task and would then abdicate in favor of the young communists.

And they almost put it across. They may lay their failure to do so to one miscalculation against which Plato had warned them over 2300 years ago. They left the children in their homes under the guidance of the unregenerate older folks. The result was that education of the young in the ideals of the new system was not unmixed with the conflicting teachings of the parents and grandparents. Instead of bringing up a generation of simon-pure communists, they found themselves faced at the end of the appointed twenty years with a young population partly convinced of the virtues of the new order but partly contaminated by too close contact with the old. The results are what we have seen, a continuance of the dictatorship,

a refusal to put Communism to the test of actual practice, and a compromise which is neither Communism, capitalism, nor pure totalitarianism. They knew of the power of emotional resistance to change and tried to avoid it, but it prevailed in spite of their precautions. Communism, therefore, has yet to be tried on the national scale.

The history of the world is comprehensible only when one gives full weight to this emotional factor ingrained in human nature which makes them hold fast to that which they have with unbelievable tenacity even while they reach out for something which they hope may be better. It is that tenacity in holding onto the things that we are accustomed to that makes progress so aggravatingly slow. Customs and habits of thought are handed on from one generation to the next through the long centuries and often survive long after their origin and purpose have been forgotten. Probably primitive men in the caves and on the plains were of necessity communists, owning and defending what little they had in common and by communities, but by the time written history begins, we find them living under the domination of despotic sovereigns who had all the property and all the rights and who suffered the individual to live only so long as it contributed to their power and their wealth and their ease. For perhaps two thousand years the individual citizen was a serf without rights or perquisites, living at and by the pleasure of his overlord. This is the sort of kingdom of which we read in the earlier books of the Bible.

Little by little, as the centuries passed, the weaknesses of this system began to undermine it. Power got into the hands of weaklings and of those who abused it beyond all reason, generating revolt and assassination and slow decay. In those days there were no radio, no books, no press, no written record for the masses to read, and changes came but slowly. In time the kingdoms broke up and were replaced by roving bands of freebooters with every man's hand raised against his neighbor, with no central power strong

enough to prevent continual petty warfare, plunder, and group assassination. It was a thousand years of *decentralization* and of emphasis upon the individual and his prowess. With divided authority came divided purpose and the cessation of progress until the better led groups began to merge, subordinating their differences to their common interests, and again increasing *centralization* became the trend out of which developed the kingdoms of the Western world. This integrating trend continued as the more able leaders welded the numerous independent states and principalities into nations and empires.

But freedom once enjoyed was hard to give up and harder still to forget. In song and legend the virtues of liberty were kept in mind and eventually showed their effect in the curtailment of the powers of the rulers, in limiting their authority with courts and cabinets and parliaments, and finally, as this renewed trend toward *decentralization* grew stronger, there began the formation of the so-called "democracies" where the rule was, theoretically at least, of the people, for the people, and by the people. Reaching its most clear-cut expression in the American and French revolutions, decentralization lasted with an ascending curve for a hundred years, starting its return to the trend of *centralization* again fifty years ago. Now in most of the world the democratic principle has disappeared, and in our land centralization has proceeded so far as to warrant our saying that we have about reached, if we have not crossed, the line that divides the system with democratic leanings from the system with leanings toward totalitarianism. Certainly the world as a whole has gone back to *centralized* authority with the prospect of a change in trend so far in the future as not to be of much concern to those of us who are of middle age, since it is not likely to come in our time.

The point of all this historical material is that the emotional resistance to change, the tendency of mankind to hang onto as much of the past as possible, while drifting with the tide of events into new situations, has at base

accounted for what we have observed in man's painful struggle to find an acceptable and workable method of governing himself in large groups. Each swing to the right or to the left has gone to an extreme which has carried the seeds of its own destruction. But each has left behind certain emotional attachments which has made each succeeding swing less extreme and of a shorter duration. Centralization of power in the hands of the few has made for efficiency—the more despotic, the more efficient—but it has been at the expense of certain liberties to which we have become attached as essential to our happiness. Swings in the direction of emphasizing the individual have brought inefficiency in administration but a freedom for personal development which has made for progress.

Each swing to the right or to the left has been less extreme than the preceding one because some of the virtues of each have been held onto and carried over into the other. Thus the first period of free individuality knew no leader and no law, and the first examples of centralization set up rulers who were under no restraint from the people they ruled. The subsequent kings had to rely upon the support of people who had learned to know and to love freedom and who meant to keep some measure of it. The later kings of this period ruled only with the consent of the governed, and out of this grew the democracies. But in this swing to individualism the virtues of administration from a central source were remembered and an attempt was made to retain both the efficiency of the central authority and the freedoms of the individual and his right to determine who should rule over him. This, with the increase of populations and the growth of industry, is again breaking down, and we are in process of swinging again to the right toward a greater supervision of our affairs by a more or less powerful central authority. Our own resistance to change has made us retain the familiar *forms* while giving up much of the *reality*. The swing toward some form of totalitarianism will, by the same token, be of shorter duration than previous

turns toward centralization and will be less extreme. Each period is shorter than the one that preceded it and less intense. It is like the dying out of a wave caused by a great splash in the center of a pond only to reach the shore as mere ripples.

And one factor is to be noticed especially. These trends are not the work of any one group. They are like forces of nature which must be met and, if possible, directed by whoever happens to be in power at the time. The New Deal is not the cause of the trend toward centralization but the result of it. It began when the members of the present administration were in grammar school. Whoever is in office must conform to the trend, and will, whatever be the party label or the pre-election promises under which he is elected. What we are evolving is apparently some form of government which will have the efficiency of the highly centralized authority without the loss of individual freedom. So far, no one has hit upon the correct formula, but the fact that we carry over from each state to the other the impelling desire to hold onto what is good in each, combined with the resulting decrease in both duration and severity of each swing, gives promise that we are blindly settling toward the golden mean at which we shall arrive at no very distant day, perhaps at the turn of the century—an elected dictator removable at the will of the people, a dictatorial democracy with both freedom and efficiency.

Another evidence of the role played in these events by the emotional resistance to change is that the excitement runs highest when the changes are most rapid and most visible. The present is distinctly one of those times. The world has always been disturbed at the time of crossing the imaginary line which divides the right from the left. At such times the resistance becomes so intensely emotional that the trend seems for a time to be completely halted or even reversed. These are minor disturbances, petty victories of those most resistant to the change, but, while they may decide elections, they do not alter the trend.

This excursion into the historical aspect of the resistance to change has been taken because it indicates to the man in industry how powerful a factor he has to deal with in this little-recognized human trait. The decade is one of drastic changes in the relations between labor and management, and it is made difficult for both sides because of this deep-seated resistance to change. In industry exactly the same struggle is taking place as is occurring in the political systems of the world. Labor, with its memory of the days when the individual worker was a free agent, is blindly resisting the new order that imposes dictation upon him from the top—through labor organizations, through powerful corporate management, and through government. Management, with its remembrance of the days when a man's business was his own to be run as he saw fit, is resisting the change toward dictation of his policies by labor on one side and government on the other. The rate of change has been too rapid to permit adjustment. The remedy, not for the ailments themselves, but for the strife that arises in the readjustment, is to slow down the process of the change itself. Resistance to change is the only force that can be looked to to accomplish this, to provide the flywheel effect so badly needed at present.

And in the smaller affairs of our daily life we may take a hint that may smooth out some of our difficulties. If we have a radical change to introduce in our organization, we can bring on an explosive resistance by making it too abruptly. Any competent management worthy of the name can see these changes developing long before the need to introduce them to the organization becomes acute. The need for the change should be made apparent to the members of the organization as long in advance of the critical time as possible. The advantages of the change can be "sold" to the group, and the disaster that would follow failure to make the change can be made quite apparent. Time is allowed for assimilation of the idea.

The emotional resistance is spread out over a period of discussion and adjustment until, if the job be well done, the new order may be actually welcomed. In fact, so well have these tactics been employed in some cases that management has been able to assume the role of hanging back until the change is demanded by the workers. Corporations with worker representation in management are utilizing this principle and finding that they materially reduce the resistance to the changes which the new conditions in industry make imperative. The foresighted management of today not only sells the idea to the supervisory force, but it gives the superiors ample time to sell it in turn to the men under them, knowing that resistance to change increases as the square of the speed of the change.

CHAPTER 9

PSYCHOLOGY AND SCIENTIFIC MANAGEMENT

As this paragraph is being written it happens to be twenty-five years to the day, August 4, since I opened my office in a New England mill city for the practice of something resembling efficiency engineering in the plants of that section. It did not take me many weeks to find out that if I was going to make any profitable connections with the mill managements, I would have to do so without mentioning those two words "efficiency engineering." If, in the course of my initial interview with the general manager, I happened to use the word efficiency, there was an immediate chilling of the atmosphere, a stiffening of the spine, a narrowing of the eyes in shrewd suspicion, a sort of "Aha, in spite of your disguise I know you" attitude, as he said, "This is not by any chance efficiency engineering you are proposing?" If I could quiet the fear and allay the dread suspicion, I stood a chance of getting a retainer. If not, my exit was not long delayed, nor were there any indications that it might be profitable to discuss the matter further on some subsequent date. The name of a rose may not affect its perfume, but the name that I gave to the work I was offering to undertake made all the difference between success and failure. They would accept my terms to make a "quarterly speed survey" or a "semiannual power inventory" but not to do efficiency engineering.

The reason for this antipathy was not far to seek. Twenty years prior to this time F. H. Taylor had begun to be a national sensation with his stop-watch techniques, which showed industrial managements that they could get two or three times as much work out of their employees

by making scientific time and motion studies, by the rerouting of material through the plant, and in many other ways cutting loose from the traditions of the past. Taylor and his associates would come into a plant and by cutting out all unnecessary motions and processes and speeding up those that remained either increase the production by fabulous percentages or produce the same amount with a fraction of the number of employees. It was very popular with the directors, but the employees did not take kindly to it.

A good example of the system was described by Taylor himself as a sort of sales talk to show how marvelously the system worked. Management, after a few realistic and effective demonstrations of the system where skilled workers in machine operations were involved, admitted that in such circumstances much might be accomplished, but in hard manual labor scientific management could, of necessity, have little or nothing to offer. Taylor accepted the challenge and selected for the trial a job which obviously called for a strong back but no high degree of intelligence, the loading of freight cars with pig iron carried from the yard pile to the car. He found that some of the husky, ignorant, foreign laborers hired for this work were in some cases handling as much as twelve and a half tons of the iron in the course of the then customary ten-hour day. For such a man-killing task they were receiving \$1.15 a day.

Taylor selected as his experimental guinea pig a big stupid fellow whom he called "Schmidt" and went to work on him. His hardest task was to make Schmidt understand what it was all about, but when he had surmounted this difficulty his progress was rapid. First he showed him how to lift the pig by using his leg muscles instead of his back, then how to carry it with the least effort, and, finally how to conserve his strength by taking time out to rest occasionally. This was almost too much for Schmidt. To believe that he could do more work if he

did not work all the time was asking a little too much. Taylor had set up as an incentive a bonus for extra tonnage handled, and Schmidt could not see in the rest periods anything but money lost by loafing. By the exercise of arbitrary authority he exacted compliance with various experimental schedules which included time out to sit down and rest. By whistle signals he set up a timed system of operations as exact as a military drill. Whistle—pick up pig. Whistle—hike for the car. Whistle—drop the pig. Whistle—trot back to the pile. Bell—rest. By the spacing of the signals the rate of walking and trotting was enforced. By trying various rates and various lengths and spacing of the rest periods, he finally arrived at a schedule which could be maintained for ten hours with no more fatigue, according to Schmidt, than had been involved in the old unscientific method. The difference was that Schmidt was now handling forty-seven tons a day instead of the original twelve and one-half. For this extra accomplishment his pay was raised so that now he was making \$1.85 instead of the previous \$1.15. At that time that was about the pay of a semiskilled worker, a pipe fitter on routine mill work. Naturally Schmidt was pleased and proud and boastful. He could live better, his wife could wear better clothes, and he could send some money back to the Old Country to bring over some more Schmidts to this land of gold where fabulous wages could be made by men with as little equipment as he had.

Others in the yard gang demanded the same deal and got it. Some could stand the pace and some were not heavy enough and had to be replaced, but there was no dearth of material at the gates anxious to be allowed to make the rate and thoroughly capable of doing so. Carrying out the same simple but revolutionary studies of the other jobs performed by the yard gang, Taylor was able to get the work of the plant done by 140 men where 500 had previously been necessary. The net saving to the steel company was about \$75,000 a year. Apparently

here was a situation so well handled that everybody was benefited, and everybody was happy. Taylor's pride in his accomplishment was justifiable.

Encouraged by his success, many of Taylor's assistants set up for themselves and the next twenty years saw a wave of efficiency work of phenomenal proportions. Nothing was exempt from the suspicion of being inefficient and unduly expensive. Office workers were put under the stop watch, billing clerks were subjected to time and motion studies and put on quota schedules, bank clerks and tellers went under the microscope and found themselves being replaced by business machines. The Gilbreths studied the ancient and honorable trade of bricklaying and reduced the motions per brick from a wasteful eighteen to an efficient five.

Distrusting their eyesight in studying the motions of manual operations, they introduced the camera to photograph the path made by a small lamp attached to the wrist of the worker as he performed his routine operations. This they refined by using a stereoscope to give the picture in three dimensions and an interrupter in the lamp circuit to give their picture as a series of timed dots instead of a simple line. By this they could tell what motions had been made with rapidity, and just how fast or how slowly. Useless or awkward movements were eliminated or smoothed out and time and energy conserved. Each operator was found to do some portion of his work a little better than the others. Each of these little excellences was seized upon and made standard, and when they were all combined they constituted the one best way of doing the job. From then on all operatives were made to conform to this one best method, and production and earnings increased and the number of workers decreased.

Why, then, with this glamorous picture of what could be accomplished by efficiency engineering, was it found inadvisable in 1914 to propose to bring these benefits to a New England mill? The answer lies in the fact that

certain fundamental psychological factors had been left out of consideration in the philosophy of the efficiency men of those early days. In their enthusiasm over the marked improvements that they were able to bring about, they neglected to take account of the fact that both parties to the alterations were ordinary human beings. Flattering results were being obtained with mathematical precision in answer to coldly scientific methods of procedure, and it was easy to assume the attitude that men at work are, when all is said and done, mere machines and must be treated as such. On the part of management this was accepted because of the resulting economies which seemed to justify the concept.

Being human, and under the high pressure of competition, the managements began to yield to the temptation to make unfair and shortsighted misuse of what had been shown them. The higher rates of pay which had reconciled the workers to the additional work looked unreasonable and unnecessary to management, and a general undercutting of rates began until finally the workers found themselves doing the added work at about the old low wages in effect before the efficiency men had done their work. On the part of the workers this tendency became associated with efficiency work as an inevitable aftermath of the stop-watch studies. In cases where the new system had been installed, they retaliated by an organized refusal to do more than a certain amount of work, no matter what the bonus might be, in order to spread the work among a larger number of workers and so prevent layoffs of fellow workers.

In instances where the study was just being undertaken, they considered an ounce of prevention better than the unattainable pound of cure later. The sight of a man with a stop watch became the signal for throwing down the tools and walking out. Efficiency engineering became so closely associated with resultant labor trouble that it came into general disrepute. This reaction was at its

height about the time I entered the field. Taylor himself had passed out of the picture about 1910, but the work went on because of its manifest virtues—as, in fact, it does to this day.

It is not a question of whether we approve of efficiency work and scientific management. Like it or not, it is here to stay, and its greater and greater development cannot be prevented by legislation nor by any form of agreement between management and workers. An excellent illustration of the inevitability of its progress was provided by the advent of Henry Ford into the industrial world. The ill repute of stop-watch management had hardly reached its peak when Ford upset industrial practices by carrying the Taylor idea one step further. Where Taylor had regarded the individual man as the unit of his study and had made time and motion studies of his hands and arms and legs, Ford regarded the plant as his unit and studied the motions of the workers as whole men. Seeing time lost by men going to toolrooms for tools and supplies and by men waiting for machines and for material to feed to the machine and time lost in setup and make-ready operations, he set up a system in which the worker remained at his place and had the work brought to him. He cut out the waiting and the make-ready by having each man do but one simple operation. The assembly belt was introduced, and the cost of making an automobile plummeted from around \$2000 to \$600. Nothing could better illustrate the irresistible force of the efficiency movement.

No matter how the other manufacturers may have disliked the new development, no matter how much a worker might resent being reduced from the level of versatile machinist to that of mere inserter of bolt 17 in the chassis as it passed his station, they had little choice in the matter. To be sure, the worker could go elsewhere to work, but not at the high pay he could make in the Ford plant. Also, the manufacturers of other cars could go out of business. They could not sell a car which was no better

at a price three times what Ford was asking. It became an instance, as it is in all such cases, of the necessity to adjust to the new methods by adopting them, or of fading out of the picture. Nor would it do any good to get all the motor manufacturers together and have them agree not to use the assembly-belt technique because of its disrupting effect on the labor market and the relations between management and worker. If such an agreement could have been reached and, having been made, could have been enforced, it would simply have transferred the motor industry to Germany or England, or Canada. An excessively high tariff might have kept foreign cars out of our market, but that would have meant for us a perpetuation of the horse and buggy days while the rest of the world advanced into the motor age. Improvements are certain to be made and, having been made, are bound to become standard practice in their fields. Unless we are willing to resort to the sort of stagnation that held old China in its crippling grip, we are going to see more and more labor-saving devices invented and adopted, and we shall see this come with increasing rapidity as time goes on. The question is not whether we like it. It is here, and we must like it. The question is what are we going to do about it? How are we going to meet it?

As a matter of fact, it is the pressing need for an answer to this question that has developed the new profession of industrial psychologist and determined for him in advance of his entering the field the direction in which he must work. Management, faced with the absolute necessity of adopting the new techniques, yet finding that their introduction was always the signal for labor troubles, finally recognized that the problem was, in its essence, a psychological one. They turned to the university psychologists and asked them what could be done about it. Bred in the cloistered peace and quiet of their campus laboratories, these psychologists were not of much assistance. They had no experience in the workaday world, and most of them

were not inclined to venture into it to attack the monumental problem which they had been asked to solve. Here and there a bolder spirit was found who could see not only the tremendous interest which might be aroused by work in the field but the vital necessity for finding a solution.

"Applied psychology," as it is now known, had not then been developed, but these men felt that if the scientific methods which they had learned in their laboratories were to have any final value to mankind, they must be applied to men in the conditions in which they lived and worked. A few pioneers took up the work and soon found they had entered a field rich in resources and awaiting only careful research to yield a wealth of practical values not only to the industry but to general psychology itself. As data began to accumulate and useful results to appear, other workers followed, first as understudies to the pioneers and later as researchers in their own right as more and more problems opened up which looked as though they might yield results when subjected to the scientific treatment which these researchers were equipped to employ. Thus industrial psychology was born although it was too feeble as yet to be weaned from the parent body of abstract psychology from which it sprang. Slowly the numbers were augmented as courses in the subject began to be given in various universities and a few progressive managements began to realize the possibilities of the work and to hire psychologists as members of their own staffs. But it was not until 1937 that there were enough specialists in the field to warrant their setting up a separate organization of their own. In that year, at the Minneapolis meeting of the American Psychological Association they broke away from the parent organization and established the American Association of Applied Psychologists which is now a flourishing group holding its own annual meetings where the findings of the year are read for the benefit of all in a rich program that offers great promise for the future of the profession.

Had it not been for the error of omission made by the efficiency engineers when they neglected to consider the psychological factors in their work, and had it not been for their demonstration of the desirability, even the necessity, of efficiency work in general, the work of the psychologists in the field might have been delayed for years and might, when it did come, have taken an entirely different approach to the problems. They might have entered the field as antagonists of the efficiency men bent on proving that the speed-up methods were destructive of morale and even of psychological well-being. As it was, they came into the picture as cooperators accepting the primary need for efficiency work as something already established beyond question, taking up the problem where the efficiency men left off and, in the beginning, endeavoring to straighten out the human problems that had resulted, and, finally, to be in at the beginning of the work and to ensure that the efficiency work would be so conducted as to prevent the inception of the problem situations as the work progressed. Thus their plan of attack along practical lines was laid down for them before they began, and it has been consistently followed ever since. As a result, in some organizations today the presence of an industrial psychologist on the staff is considered to be as necessary and as profitable as that of a cost accountant or sales manager. His work is continuous and constructive, and at least half of his time is spent in research in the plant, in scouting out problem situations, and in devising means of meeting them and preventing their recurrence.

One of the features of the now respectable amount of work that has been done is of especial interest. It has been found by hard experience that the tests and remedies that fit the needs of one organization like a kid glove on a lady's hand cannot be transferred to another plant even though the second plant may be engaged in apparently the same line of manufacture and employ the same general grade of help. The *methods of attack* used in the first

plant may be carried over with equal success to the second, but the resulting findings, the tests developed in this second plant, and the remedies applied will be different and again will be suitable for use only in the plant in which they are evolved. But, although each situation is one of its own kind, success in solving it in one plant offers strong suggestion that the same sort of a problem elsewhere may be equally well met by applying the same techniques.

As reliable information has accumulated during the past decade, it has been necessary to discard some previously popular misconceptions that have been shown to be little better than superstitions. When an investigator organizes a force of twenty interviewers who spend three years talking individually to twenty thousand employees in a single plant about the things they like and dislike about their work, their surroundings, their pay, their bosses and the management, he is beginning to get data and information which go beyond the realm of mere opinion.

In all this work the one factor that is continually brought out is that it is the small things that count. Efficiency and discouragement do not team up together. We cannot expect workers to put forth their best efforts if they are continually beset with minor irritations. The primary factors of wages and working hours and safety are important, but deficiencies in these items may be conformed to by the same man who will quit a job because no suitable place is provided for him to hang his street clothes during working hours. A sand hog will work in a high-pressure caisson under the river with the ever-present risk of a cave-in or of the agonizing, and even fatal, "bends" which may result from too sudden release of the pressure, yet he will refuse to work for a boss who treats him as an inferior entitled to little or no consideration rather than as a man among men. Wages affect the pocketbook and long hours curtail leisure time; but irritations affect the emotions, and we are beginning to realize that the essence of employer-employee relations is a sane consideration of

the factor of the feelings of the man on the job. And notice that we have used the word "consideration." This does not mean "pampering." But feelings must be taken into account.

No man can work efficiently who does not have an interest in his work. A good deal of the modern efficiency measures have been in the direction of lessening that interest. The old pride of proficient accomplishment which came with long service and a wide experience in the trade has been removed from many of the mechanized jobs of modern industry. In the old days the veteran journeyman appeared to the eyes of the aspiring young apprentice as surrounded by much the same sort of halo as surrounds a Bob Feller for the sand-lot ball-playing youngster.

One of the serious jobs of management today is to find some way of restoring the interest that has been lost. How many men would there be on a golf course today if there were no score cards, no record or count made of the number of strokes taken to get the ball from the tee to the cup, no specified number of holes to be played? Suppose the doctor ordered you to go out on the links for seven hours a day and to follow the rules of the game in every respect except that all forms of scoring or keeping track of the number of holes played must be omitted, round and round the course with no knowledge of whether you were doing better today than you did yesterday. Would you find it interesting? Suppose the number of hits and runs were not recorded in a ball game. Would 25,000 people come out to see the demonstration of skill? The truth is you could not keep the golfer or the ball player from scoring his performance. The score is the game. We must and we will make comparison of one man's performance with that of another, of our own performance today as compared with yesterday, last week, last year. What do golfers talk about when they get together? A par four, a birdie, an eagle, a hole in one, breaking a hundred, a record 76 on the hilly Heatherbloom course.

One of our troubles in industry is that we have removed the "score" from the job.

When I stressed this need of finding some way to restore the score to jobs now called monotonous because they are unvarying, a supervisor asked, "How would you impart interest to a job we have in which, all day long, every day in the week, a moving belt brings an unending load of wrapped merchandise to a row of men stationed alongside whose sole duty is to pick up a package, weigh it, mark the weight on the wrapper, and toss it to one side for someone else to dispose of further? They do not know where the package comes from, they do not know what is in it, and they do not know where it is going. They do not know how many they handle in a day. All they know is that no matter how fast or how long they work the belt keeps coming with its inexhaustible load of parcels. How are you going to make that interesting?" I replied that nothing would be easier, although I doubted whether the management would take kindly to the suggestion. Suppose the eight weighers were informed that under some one of eight parcels at the end of each thousand on the belt there would be placed a dollar bill which would become the prize of the man who happened to pick up that package. The reward comes up once for every thousand parcels. It may be under No. 1001 or 1002, or as late as 1008, but each man has one chance in eight of getting it. In the course of a year the law of probabilities would take care that an even distribution resulted. I asked him if he thought there would be any interest in the job then. He answered that the main difficulty would be that they would demand more speed on the belt. It would be the most popular job in the plant. After all, the reward is only $12\frac{1}{2}$ cents per thousand for each man. That much put into the pay envelope at the end of the week would have the same financial value but not the same interest value. There is no logic in interest. It is a matter of the feelings.

One of the replies that is frequently given when this matter of making the job interesting is being discussed by a group of supervisors is that the situation itself provides enough interest and incentive through the ever-present hope of promotion to the next rung of the ladder that leads to the upper levels of supervision and management. The supervisor who offers this argument is speaking from his own experience, and it was true for him when he had the job at the bottom. One of the advantages of the modern method of statistical investigation is that it sees these things objectively and in the mass, rather than through the eyes of a single prejudiced observer. And we find that most men do not want promotion. They do not like to handle men. They do not want to assume responsibilities. They do not want to have to make decisions. They want to leave their work in the plant when they go home at night. They have seen some of their friends who had ambitions without abilities to back them up, promoted to supervisory jobs only to fall down on the job with the alternatives of being demoted to the old job or of being dropped from the pay roll for incompetence. The supervisor who makes good is a special case. He had what it takes, and he had the desire to get a chance to exercise his abilities for the greater reward in pay and prestige that goes with the promotion. To such a man special incentives are not necessary. It is not for the 3 per cent of his sort that we are speaking, but for the other 97 per cent. It is part of the supervisor's job to study these men and to devise ways and means of giving to the work a false interest which the work merely as a job does not possess. Without interest there can be no real efficiency.

CHAPTER 10

SOME FACTS ABOUT LEARNING

Learning is a process that does not end when our school days are over. It begins as soon as we are born (some say even before that) and continues as long as we live. Most of our learning is merely a sort of by-product of the process of living, and we are hardly conscious of each new acquisition that results from the experiences of the day. Because as school pupils or college students we are compelled to focus most of our attention on the process, and because our learning is then proceeding under the direct guidance of another, we are apt to make a distinction between learning and working. We think of our school years as a time during which we are providing ourselves with mental tools and of our going to work as the beginning of a period in which we are going to put those tools to use. Unfortunately it is not true, or it is true only to a negligible degree. This is one of the jolts that the lad just out of school is bound to get. He finds he is not out of school. He finds that he has more to learn and less time to learn it in than he ever had in the more or less leisurely procedures of the classroom.

Furthermore, one of the little ironies of our American system of schooling intrudes itself into the picture about this time. For the eight, twelve, or sixteen years of his school career he has been learning not only facts out of books, but habits out of experience, and one of those habits is the comfortable one of considering that if he does 75 per cent of his work correctly, he will meet with the approval of those responsible for his training and be "promoted." If he is correct in 85 per cent, he is ranked as "good," and if he reaches 90 per cent, he is classed as excellent and

may win a prize of some sort for his outstanding performance. It is not his fault that he learns this superficial and slipshod standard of measures. It is part of his training, just as much a part of it as it is to learn that the River Po is not in Poland. This is one piece of mental equipment he has acquired in school that he is not going to be able to use on the job. We have forced him to learn that 80 per cent performance is pretty good, and now without warning we pitchfork him into a job where if he does only 95 per cent of his work right he is fired. And from the experience you have had with boys and men just out of school, high school, or college, you know that it is easier for them to learn how to feed a punch press, solder a terminal, or file correspondence, than it is to learn that the old standards of excellence no longer apply. Which would you rather have—a man who knows where the Po rises but who has learned that it is all right to do a quarter of his work wrong, or one who never heard of the Po but has acquired the habit of doing not over $\frac{1}{4}$ of 1 per cent of his work wrong? Odd, isn't it, that after all these years, we still take youngsters in the years in which their habits are being formed for life and compel them to form this bad habit?

Notice the title of this chapter, *Some Facts about Learning*. In a dozen pages on the subject we cannot even hit the high spots. About all we can do is to take a look at it through a telescope from a distance. It is safe to say that more work is done in the field of learning than in all the rest of modern psychology put together. Many professors experiment in the laboratory with the laws and principles of learning to the exclusion of all other subjects and continue to do so for a lifetime. In fact, some of them maintain that if you know all there is to know about learning, you know all there is to know about psychology. No five-foot bookshelf would hold the printed publications on the subject. If the paper is not too heavy and the print not too coarse, the shelf might hold the books,

articles, theses, and reports for the current year, but another shelf would be needed for next year's contributions.

About all that we can hope to do here is to point out some interesting things that apply to the kind of learning with which we are concerned in business and industry. Most of them are things you already know if you are an old hand at the game, but even in these instances you may see them in a new light so that they mean more to you. If so, you have learned something yourself. The man who is so satisfied with his own answers to all the questions as to think he has little left to learn, or who has accumulated a stock set of unvarying responses to the situations of life is old, whether he is twenty-five or sixty-five. He is still young if he not only knows there is much to learn but is keenly alert to every opportunity to acquire new knowledge, new ways of thinking, new habits of life. There is probably no person, no experience, from which we cannot learn something. It is an efficient provision of nature that each of us has to do his own learning. No one can learn our lessons for us, nor can we begin where our parents left off. We all have to start from scratch, and we end up with only what we have acquired by our own efforts along the way.

One of the things a supervisor is likely to overlook in his effort to train a new man is just this factor, namely, that the man has to do the learning, that it is an active and not a passive process. The foreman feels that if he tells the man what he is to do and how he is to do it and then gives him a demonstration, the desired learning takes place as a matter of course if the man has a fair degree of intelligence and common sense. Unfortunately, this is not all there is to the process. You cannot pour learning into a man. All you can do is remove as many of the difficulties as possible which stand in the way of his learning. "Teaching" is really merely a guidance to aid the process of learning.

We are not intimating here that the verbal description of the task should be dispensed with or that showing how the

work is to be done is valueless. Quite the contrary. We should say that these are the first two necessary steps in instruction. But there is one thing we have found out from careful studies and that is that a man "gets" very little of what he is told. His ability to grasp and hold onto more than two or three items when being given directions is not so much a matter of intelligence as of habit of paying attention. The foreman gives a man a detailed description of a process and pauses from time to time to say, "Get me?" and when the man answers, "O.K.," he goes right on to the rest of the story.

If the foreman thinks any bright man ought to be able to follow such simple instructions as he gives, let him recall what happened the last time he was out in his car and did not know how to get to his objective. He drove with his five passengers into a filling station and asked the attendant for directions. The attendant knows the answer and gives perfect directions: "To begin with you are going in the wrong direction. Turn around and go back half a mile to the gravel road at the schoolhouse, turn to the left there, and follow that road to highway 16 which you should have taken back in town. Follow 16 north about twelve miles, and at the top of the hill beyond Johnsville you will see a cemetery on the left. Turn to the right on the black-top road there and go on for two miles to a little lane off to your left opposite the stone church—and there you are."

Perfectly simple, but about the only thing the foreman is sure of is that he was going in the wrong direction and has to turn and go back. The six people in the car all heard the directions so he feels he is not taking much chance. What one may have missed the others will have remembered. False hope. Anyone who has been in this situation—and who has not?—knows that he has a carload of six different recollections, and each passenger is sure he is right although no two agree. The net result is that he stops at the next filling station and asks again.

The trouble was that he and the others did no "learning." They did not exert themselves to make the directions their own while it was still possible to get reinforcing help for the parts that got away. The driver should have said, "Now let's see if I can repeat that. I go back the other way for half a mile and then turn—which way? Right? Oh, left. Turn left half a mile down and" And so on until he can repeat everything including the lane opposite the church. Instead, he hates to admit he cannot follow such simple instructions so he does just what the man does whom he instructs in the plant. He says, "O.K. I get you!" So it is a first principle to make sure that your man has retained all the points by getting him to give them back to you. When you find he cannot, do not bawl him out and yell at him to take the cotton out of his ears. Remember that day in the car, and say instead, "Good. You got more of it than most folks do. Now let's go on from there and add some more items. In a few trials you will have it." But you do not merely go on from there. You start at the beginning and then go on. The second time the man has a greater incentive for holding his attention on what you are saying because he knows he is going to have to repeat it to you. If you are not only patient, but careful not to show annoyance or a bored sort of condescension, as of a smart man talking down to a stupid one, you will save yourself trouble and him embarrassment. If he becomes embarrassed or sore, he becomes confused, and your task becomes twice as hard. It usually helps if you reverse the situation and say, "All right. Now pretend you are the instructor and I am learning. What is it I must do? You tell me."

But when he is letter-perfect, he has not learned the job. He has merely learned about the job. I knew a man who could talk for an hour about the process of making good whisky—how long it ought to take, what the ingredients should be, how the liquor should be purified, and how long

it should be aged and how, why one whisky was "smooth" and another "raw," and how the different grains were treated to make the different kinds. But if we blindfolded him and gave him a sip of whisky, he could not tell whether it was dollar quality or ten-dollar quality, whether it was corn or rye. He knew all about whiskies, but he did not know whiskies.

In the chapter on Human Habits we pointed out that habits may be formed in any one of the three systems. This man that you are instructing has formed a verbal habit but not yet the corresponding muscular one. The verbal directions are given to him first because they help him to focus his attention on the procedure which you are going to show him step by step. He has a framework into which to fit each part of the action as he observes it, just as you used the stone church as a marker for turning into the lane. If you later made that same trip a dozen or more times, you would no longer be looking for the stone church. You would be turning into the lane without giving the stone church a thought. Now, when you demonstrate the process in slow motion he notices things that he would have missed because he is hooking the sequence of motions onto the sequence of words which he has already learned. After a few slow-motion illustrations, you go through it several times at the regular job speed so he can see the whole pattern and then you are ready to let him translate what he now knows about the work into the doing of the job with his own muscles.

And here is another thing that will make it easier to be patient with the man who seems so blundering at his first attempts. It used to be said that we learn to do a thing by doing it. We don't. We learn by doing something else, something *like* what we are trying to learn, but not the thing itself. If you are a golfer, you know that you did not learn to drive 180 yards down the middle of the fairway by driving 180 yards down the middle of the fairway, but by missing the ball altogether, by topping it, by slicing and

hooking and digging divots. Some of what you were doing was approximately correct, but much of it was wrong. Learning, then, consists in eliminating the wrong portions while retaining the correct pattern. This sort of learning is the usual process in acquiring muscular skills though it does not apply to any great extent in most verbal learning. We may expect our apprentice, therefore, to make only a fair approximation to the desired results in the early stages of his learning and will devote our energies to pointing out to him the various errors that he is committing and to helping him to eliminate them. These should be taken up one at a time and as things quite to be expected. As each error drops out, a word of encouraging appreciation speeds up further learning, for most people do better when they know that they are making progress. Up to this time the foreman has remained in close supervision of the whole process. He can now safely leave the man to his own resources, coming back, frequently at first, as though to congratulate the learner but in reality to correct any faulty motions that have crept into the performance so that they may be eliminated before they tend to become fixed as habits which it may be difficult to get rid of later.

If the instructor is skilled in the task that he is teaching, it may be impossible for him to remember the difficulties that he encountered when he was the learner years ago. Under such circumstances he is likely to overlook in his instructions factors which seem now so obvious to him that they are not worth mentioning. He is then likely to be a trifle inclined to be intolerant of the beginner who slips up on some of these apparently obvious details. Actually the fault lies not with the learner but with the instructor. We have found by much experimentation in many lines, that mere repetition is not enough to ensure learning. There must be an intent to learn. It is the supervisor's duty to see that that intent is implanted as part of the preliminary instructions.

In order to realize that even frequent repetition does not ensure learning, ask your friends to tell you what the numbers and letters of their auto license plates are. Most people do not know, yet they have seen them hundreds of times. Or ask a man whether the numbers on his watch are Arabic or Roman numerals. Ask him whether the 6 (or VI) at the bottom of the dial is right side up or upside down. Unless they have been asked this common trick question before, they betray the fact that they have never observed the numerals closely since the space is usually taken up by the dial of the second hand. You may not be able to tell how many steps there are in the front stairs leading up to the second floor of your home. But then, you have never had any intention to learn it, although you have had plenty of opportunity and repetition.

Take the amusing case of an experienced professor of psychology in a large Eastern university who was working out a learning experiment with a class of thirty men and women. He wished to find out how long it would take each member of the class to learn a list of meaningless syllables by hearing them read to him by the professor. Because of certain features of the experiment it was necessary to read the list to each student separately. Each student entered the room, had the twenty syllables read to him, left the room, and was followed by another student who heard the list read, and so on, through the thirty members of the class. Some were able to repeat the list with twenty repetitions, and some took forty or fifty. At the end of the test the lad who had required fifty-four repetitions said to the professor, after they had all returned to the classroom, "Professor, I was the dumb-bunny of the lot. It took me fifty-four trials. But I noticed that even on my last trial you were *reading* the list from the paper. Can't you say them from memory?" The professor thought he could and tried and got no further than the fifth before he fell down. The class was much pleased. They pointed out that whereas the worst of them had needed only fifty-

four he had had the benefit of possibly a thousand readings and still was not able to repeat the list. To save his reputation, it was necessary for him to point out, first, that in reading the list rather than trying to repeat it from memory he was following standard practice. Under such test circumstances the list is always read rather than recited to ensure greater accuracy and eliminate any slips that might be made by carelessness or by faulty memory. Second, that he had no "intent to learn." To demonstrate that it was not stupidity on his part, he asked to be allowed to hear the list read by some member of the class until he could repeat it correctly. Seven times were all that were required. There had been considerable imperfect learning during the many repetitions so that when the intent to learn it was brought to bear on the problem, it did not take long to establish the list correctly in his memory.

Having described the operation and demonstrated it to the learner and being now ready to let him try his hand at it, which are you going to suggest to him—that he start right in at the full speed and tempo of the job and improve the accuracy and smoothness of his motion as he gets experience, or that he begin with slow motion but perfect accuracy, maintaining this smooth correctness at all times and letting speed come with experience? There are, of course, some operations where there is no choice in the matter. The speed of the machine is fixed and cannot be reduced to accommodate the learner. But where there is a choice, stress the accuracy and smoothness and let the speed come later. It is much easier to increase the rate at which a well-learned series of motions is being made without introducing any change in the pattern than it is to correct false motions that have become habitual during the early stages of an attempt to acquire accuracy and speed at the same time. That it is more effective to stress accuracy rather than speed from the start has been demonstrated experimentally many times both in the laboratory

and in the plant under practical working conditions. The man who learns the operation at its normal speed produces more for a while than does the man who is bent on accuracy, but as the latter picks up speed he will pass the former in production and reach an output that the other man may never reach or will reach only after a long and painful process of rooting out a number of bad habits that have had time to become firmly set. Furthermore, there is always the tendency for these early bad habits to crop out from time to time later on in times of fatigue or inattention, a handicap that the man who has maintained correct motions from the start does not suffer from.

But suppose the operation that you are trying to teach the man is composed of a cycle or series of, perhaps, nine distinct motions which must be made in sequence and with proper timing. Shall we drill him on each part separately until he gets it down to perfection and then let him establish the complete pattern by fitting together these well-learned parts in their proper order? Or shall we insist on his learning the whole pattern as a single unit from the start? Shall we tend the machine ourselves and let him merely pull the ejector lever until he has learned how and when to do this one thing and then drill him thoroughly on the one motion of placing the blank on the die while we control the rest of the operation? Or shall we make him go through the whole cycle in 1, 2, 3, order from the start, even though he is awkward and makes errors that result in some spoilage?

This is an old problem for the laboratory and industrial psychologists. They call it the "part-whole problem." There is no universal law covering the problem. It is a matter of the number of motions involved, their complexity, and the degree to which they fall into an integrated pattern when combined. With few exceptions it will be found that better results are obtained by learning the pattern as a whole from the start. It reduces fatigue and promotes smoothness and accuracy if the pattern

tends to run itself off as a rhythmical unit from start to finish, each motion flowing into the next with a minimum tendency toward false motions, jerkiness, or hesitation. A pattern learned in pieces and put together later has a tendency to fall apart again in emergency situations or when the operative is tired or distracted. Also, and this is rather surprising, it has been found to take less over-all time to learn the entire sequence if it is learned as a whole rather than in sections.

One other factor of the learning period is of interest although advantage cannot be taken of it in many cases. It concerns the question as to how long a man should be kept at the attempt to master his task without taking time out to rest or to do something else. Assuming that the task is such that in the past it has been found that a man can master it in forty-four hours when he puts in straight time at it for five full days and a half day on Saturday; can he learn it in fewer hours by arranging his learning time on any other schedule? Many data in many sorts of activities are available to indicate that four-hour learning periods are less efficient than shorter ones. Actually it has been found that if the learning periods are limited to from a half-hour to an hour, it will take less than the usual forty-four hours of learning time to master this task. This is based on two facts:

First, the learner is under tension throughout the period. He must keep his attention on each individual factor of the task, none of which has as yet become wholly automatic. No one can maintain unremitting attention for long stretches of time without experiencing undue fatigue. For most of us the attention cannot be held to the job for much over half an hour. For a little while after that, we can maintain a fair degree of attention, but distractions soon begin to divert us from the details of the job in hand and learning becomes proportionately less efficient. During the brief intervals when the attention wanders, errors creep in and tend to become fixed as bad

habits of performance. Thus the time spent after the first hour yields less return per unit of time spent, and as the period stretches out, the additional time may even introduce a loss rather than a gain. Where it is possible to do so, then, the learning period should be stopped at the end of an hour and the learner made to rest and relax for an hour or put at some other task with which he is familiar. He then comes back to the task of acquiring the new techniques refreshed and with renewed capacity to hold his attention on the job in hand. When this breaking up of the time into hour-long periods is possible, it will be found that less than forty-four periods will bring better mastery than will the continuous application for an entire forty-four-hour week.

Second, by breaking off the learning process just when it begins to be irksome, we give an opportunity for the learner to lose the tendency to repeat the errors that are beginning to creep in as the attention becomes fatigued. If we keep him at it, hoping to drive out the errors by not quitting until he has eliminated them, we are increasing the tendency for the errors to become more and more firmly established since they are more and more likely to occur as he becomes less and less able to hold his attention on the task. Most of what he is doing is correct, and that portion will tend to remain with him. When we notice errors beginning to occur, we give him time off in which to forget the errors, so that when he returns, there is less tendency for them to be repeated. This produces the phenomenon which the psychologists call "improvement in a period of no practice." Formerly it was thought that there was some sort of unconscious learning taking place in some mysterious subconscious mind while the person was thinking of other things. It appears that way because we usually find that the person does better when he comes back after a rest than he was doing just before he stopped. No new learning has taken place, but some forgetting has been accom-

plished—the forgetting of the errors which are not so well established by repetition as the main body of correct performance. Thus, the man's performance upon his return to the task is better because these errors have dropped out during the period of no practice.

In a previous chapter we spoke of the incentive value of some kind of a score to register the amount of work done in a given period of time. This device may be used to excellent advantage to speed up the learning process. It has been demonstrated time and again that knowledge of the progress being made while learning shortens the learning time materially. Take, as an example, the case we have supposed in which forty-four hours is the normal time allowed for reaching standard values of production. If the apprentice is given a sheet of cross-section paper with the hours of practice laid off along the bottom and the production per hour along the left-hand margin, he can plot for himself a "learning curve" which will provide interest and incentive to the whole process. At the end of the first hour he marks a small x in the square corresponding to the number of pieces he has produced. If he has made six, he places his x six spaces up over the 1 which represents the first hour. At the end of the second hour he finds he has made, perhaps eleven, so he puts his x in the eleventh space above the 2 on the bottom line. Each hour, for a time, he will be making better and better scores, and he will be approaching nearer to the line that has been drawn across the paper to represent the acceptable standard production. By looking at his curve he can tell at any time not only how much progress he has made, but how much more he has to make to qualify as a trained man. He can see whether there is a good chance of his beating the allowed time or whether he will need to exert more effort to come within it. The learning process takes on all the features of a game which becomes of itself a spur to achieve results. This is especially true if the man is

told that as soon as he boosts his curve up to the line representing par, he graduates from the learner class and goes on regular production.

Again it is probably worth while to call attention to the fact that in dealing with learners in industry we are dealing with human beings and to remember that human beings are "motivated" by their feelings rather than by an appeal to cold intelligence or logic. Your own task of assisting them to learn is made shorter, simpler, and easier, as well as more pleasant, if this truth is kept in mind. A man pleasantly motivated is a better learner than one impelled by unpleasant emotions. An ounce of encouragement is worth a pound of fear or dread of failure. It is not only for the sake of the man that you utilize those tactics which make the learning task interesting and even pleasurable, but for your own sake and that of the company. It lightens your labor and reduces costs. In general, it costs \$50 to \$300 to break a man in. If this can be reduced 10 per cent, the saving is worth the effort. But the psychological factor is even more important. A man who actually enjoys his first days with a new corporation is predisposed to think that he has made connections with an organization that he is going to be glad to work for. It would be worth while even if it cost somewhat more to ensure that the new employees start out with this attitude. Since it can be done not only without expense, but at an actual cash saving, there is little excuse for not devoting some thought to studying out methods by which some of the principles touched on in this chapter may be applied.

CHAPTER 11

NORMAL AND ABNORMAL

We are likely to pride ourselves on being "normal" men and women. Most of us would resent being referred to as "abnormal." As a matter of fact it is probable that most supervisors are abnormal, else they would not be supervisors. Normal means "close to the average." Abnormal means sufficiently removed from the average to be outstandingly noticeable. In this sense of the word, about 60 per cent of the people are normal, perhaps 20 per cent are abnormal in that they are superior to this average group, and another 20 per cent are abnormal by reason of their inferiority. It is this low-grade group, which is defective in some way, that most people have in mind when they speak of abnormality. There is no definite demarcation between the normal and the abnormal. There is no fixed line which can be scientifically defined so as to permit us to say that all on one side of the line are normal and all on the other side are abnormal. What is normal in one set of circumstances may be abnormal in another. What is normal in one century may be abnormal in the next. What is normal in revolutionary Russia would be abnormal in Boston. The whole personality has to be considered, as well as the surrounding conditions in which the person lives. In this chapter we shall concern ourselves only with those who are abnormal in the common-sense view, those who are different from the general run because of some defect that tends to make them misfits in the "normal" workaday world.

I consider it worth while to treat of the matter of abnormalities in a book in the field of industrial psychology not because I think that the supervisor is likely to have

cases of the sort to deal with, but because of the deeper insight into the normal which is gained when we know something of the abnormal. When, just out of high school, I decided to go into the field of gas-works engineering, I secured a job as timekeeper on a construction gang building a new gas works in Omaha, Nebraska, for a large Eastern syndicate. The day before I left for the job, the general manager who had hired me gave me some good advice, most of which is now forgotten. One thing he said, however, must have made an impression because it is remembered today as well as though it were not forty-two years ago that he said it. "You are starting out to learn the gas business. On this construction work you will work around many plants in various parts of the country. Wherever you go make arrangements with someone at the plant to let you know whenever anything goes wrong in the plant, whenever they plan to take a machine down for repairs or to remedy trouble. No matter if it means staying up all night to see the job done, be on hand to watch and, if possible, to work on it. You will learn more in a single night of fixing up some piece of apparatus that has gone wrong than you will learn in a year in a plant where everything is running along smoothly."

This was good advice for a young man anxious to learn the gas business. It is just as good advice for anyone who wants to know something about human psychology. Not much headway was made in human psychology until the abnormal unfortunates were considered as psychological cases rather than as victims of witchcraft or as sinners whose souls were possessed by the devil. When we began to see that they were like us, except for some lack of capacity or lack of ability to use what capacity they have, we began not only to understand them better but ourselves as well.

One of the most easily recognized defects has always been that of feeble-mindedness. It is a defect that is present at birth, and there is little that can be done for

the person so afflicted. It is an hereditary taint cropping out now and again generation after generation. The cure lies in preventing such defectives from reproducing their kind. It is not generally known, but sterilization of the feeble-minded is legal in twenty-nine of the forty-eight states. In California it has been in force for thirty years, and over 12,000 sterilizations have been performed. If all states did as well, feeble-mindedness might now be on the wane, instead of on the increase. In time this incurable defect which afflicts 1 per cent of the total population could be entirely eliminated.

It is not left to the family physician or to the opinion of the schoolteacher or to parents, or to other members of the family to determine the diagnosis of feeble-mindedness. There are well-standardized tests recognized the world over by which the relative degree of intelligence may be determined. A series of tests has been devised which starts with tasks simple enough for a normal three-year-old child to perform and advances step by step with increasing complexity up to tests that are difficult for a bright high school student. The average six-year-old child goes up to about a certain point in the series before the items become too difficult for him. The average seven-year-old child goes a little further, the ten-year-old still further. The point to which the average child of a given age can go is called normal for that age. If the seven-year-old child is able to do the tests normal for a seven-year-old, he is said to be average. He has an intelligence quotient of 100. But if a ten-year-old cannot go beyond the tests for a seven-year-old, he is below average and is said to have an I.Q. (intelligence quotient) of 70 the level where he breaks down in the test divided by his age. Had he gone only through the tests for six-year-olds, he would have an I.Q. of 60. If a six-year-old child can do no better than the average three-year-old, he has an I.Q. of 50. And this I.Q. tends to remain about the same through life, that is, if a child of six can do only the tests for three-year-olds, at

ten he will be able to do no better than a normal five-year-old. In general the bright child is the bright adult when he grows up, and the dull child is the dull adult.

Although there is no invariable rule, psychologists usually class anyone with an I.Q. of less than 70 as feeble-minded, and in some states this rating would be enough to make it legal to have the person committed to an institution. Below 25 I.Q. ranks the individual as an idiot. Such a person cannot learn to take care of himself in any way and remains at the infantile level. Between 25 and 50 he is rated as imbecile and as such can learn only the simplest responses but never enough to meet the conditions of life without continual guidance and assistance. Between 50 and 70 come the various grades of morons. At the upper level they can be taught to do work around the house and perhaps perform some simple operations in an industrial plant but should not be expected to acquire complicated skills or exercise any great degree of judgment. It is only rarely that workers of this level are to be found in the ranks of industrial workers, but from that level up to the average I.Q. of 100 they are not uncommon. They are regarded as dullards whose limits are soon reached in the routine jobs. They do not have what it takes to follow any complicated directions or to exercise nice discrimination. They are not material for promotion, but they fill the bill perfectly where they work, and industry would be hard put to it to get along without them.

So far we have been speaking of deficiencies in the field of the intelligence. In general, it is an inborn defect, although, of course, it might be the result of disease or accident affecting the brain structure. Most of the patients in our county and state hospitals for the mentally afflicted, the so-called "insane asylums," are people who started out in life with apparently normal mental equipment but who from one cause or another have broken down under the conflicts and stresses of a life too complicated for them to meet with satisfactory adjustments

and adaptation. They escape from the too hard reality into a more pleasant sort of dream world of their own. Although we find some among these groups whose trouble may have its source in physical, chemical, or bacteriological sources, the symptoms of these, as well as of the purely psychological cases, are mainly in the realm of distorted emotional reactions to everything and everybody around them. In Chap. 7 we discussed three ways of meeting the conflicts of life and said that one method was that of avoidance, of getting out of the situation by running away from it. A great many, if not a majority, of the cases in the asylums are examples of this process, except that in their case, the running away was psychological. Since, in mild and normal form, examples of this psychological escape reaction are not at all uncommon in industry, it will be worth investigating in more detail. To most supervisors it will immediately bring to mind certain cases that they have met in their own groups, and if they are sufficiently analytical about themselves, they may even recognize some of their own reactions as falling in this category in the past or even, although most of us will not admit it, in the present.

To give some idea of the power of the factor that we are considering, let us examine a case of so-called "shell shock," such as was developed by thousands in the World War. All sorts of mental disintegration developed when men were called upon to meet the unprecedented terrors of modern front-line warfare. Some men "lost their minds" completely and reverted to the level of the infant unable to talk, to understand words, to walk, or even to take care of the ordinary needs of everyday life. Others became stone-blind. Some developed more or less complete paralysis or lost all sensation of touch or pain in the body surface. "Tics," those uncontrollable twitches of facial muscles, of fingers, arms, and legs, involuntary but constantly repeated, developed in hundreds of different forms. Since this variety of afflictions could not be traced to any one

set of nerve pathways, or even to any one section of the brain structure, the army surgeons provided a ready explanation by ascribing the visible results to an invisible destruction of brain tissue by the concussions incident to the use of high-explosive shells. The reason these shell-shock cases had not been common in previous wars was that the smaller shells filled with old-fashioned black powder were not only much less powerful in the size of the charge, but much less sudden and violent in explosiveness. Since nerve cells once destroyed cannot be replaced, there was nothing to do with these cases but to send them home to the various hospitals where many of them remain to this day, now hopelessly incurable and useless to themselves and to society in general.

It was not until the war was nearly half over that it began to be recognized that the addling of the brain by shell concussions did not account for what occurred. Many cases recovered in the emergency hospitals behind the lines, many on the way home, and others under the care of family physicians or in the hospitals at home. These reactions were not confined to our own troops, but were duplicated in the armies of all the nations engaged in front-line warfare. The recoveries were so miraculously rapid in some cases and so incompatible with the idea of nerve-cell destruction in any case that a new solution had to be offered. It was here that the psychiatrist, the psychoanalyst, and the clinical psychologist entered the scene and among them arrived at the conclusion that, in spite of all evidence to the contrary, the ailments were unconsciously self-inflicted as an effective means of getting out of the trenches and away from the utterly intolerable horror of filth, death, and destruction which accompanied this war.

The similarity between the symptoms thus induced and those that could be brought about in a normal person under hypnosis was early recognized. It has long been known that under hypnotic procedures a person can be

made to lose all sensitivity in portions of the skin so that pins and needles may be jabbed into a thumb without any resultant pain. Artificial blindness can be induced to such a degree that so long as the hypnosis is maintained, the person is to all intents and purposes without sight. Deafness, loss of use of the muscles, loss of memory, and a hundred similar manifestations had been temporarily induced in experimental hypnosis in the laboratory, especially abroad where research in this field has been more extensive than in America. The fact that these artificially induced symptoms disappeared as soon as the person was awakened from the hypnosis was too similar to some of the sudden, overnight recoveries of the shell-shocked victims to escape notice. It cannot be too strongly emphasized that these effects were *unconsciously* brought about by the patients. They did not fake the ailment. They did not set about to fool the surgeon by pretending to be blind. They *were* blind. Their limbs *were* paralyzed. They *did* revert to infancy, crawling on all fours, babbling and drooling like any ten-month-old baby.

An interesting light was thrown on the situation when it was observed that the particular symptom any individual developed could frequently be directly connected with something that had happened at the time the ailment developed. A man isolated in a shell hole between the lines, who sees his comrades maimed, blown into the air, decapitated, writhing in worse than death, suddenly goes blind and deaf and shuts out the whole horrible picture as effectually as though he had been lifted up bodily and carried back to rest areas. A man was carrying the body of his buddy on his right shoulder back to the second-line trench from a night raid in no man's land; the body was blown to bits by a direct hit which miraculously only stunned the bearer. When he came to, back of the lines the next day, all recollection of the event was gone, but so was all feeling in his right shoulder and all use of his right arm, nor was he able to hold his head erect. It remained tilted

at the same angle as it had been while he carried his burden. There is no one center of the brain whose injury would bring about these different manifestations, yet later when the cure was effected, when one symptom disappeared, the others went with it.

A man standing ankle deep in the cold water of a trench finds his feet and legs becoming numb as might any of us under similar conditions or while wading a cold stream on a vacation fishing trip. But when the numbness reached the point of incapacitating the man for immediate service, he had to be taken out of the trench into a dugout where he could warm up while another stood at his post. Without realizing it he had found a method of escape. The numbness came more quickly and more severely until finally it failed to disappear during the rest periods and became chronic and permanent and his usefulness as a soldier was at an end.

It must be noted that these escape reactions came only to those under severe conflict situations. The man who had no fear had no conflict. The man who gave way to his fear and took to his heels or in less obvious ways dodged his duties and responsibilities had no conflict. But the man who was normal experienced all the fears and horrors and repulsions of the war and held himself at his post only because his sense of duty outweighed his fears, or because of his knowledge that the consequences of showing the white feather were worse than the agony of remaining where he was. In either event it was a conflict situation of the most intense sort, calling for courage of a high order. Under the high emotional stress something akin to self-hypnosis took place, and without intent or even conscious connection between the cause and the effect, the man seized upon some minor circumstance which suggested something that did not really exist, but which, if it did exist, would provide an honorable solution for the conflict and an escape from the situation. Without realizing that he was doing so, he made it real, and it removed him from

his dilemma. In some cases the ailment remained, but in others it left suddenly or gradually when the need for it ceased to exist. In description it looks like faking, willful malingering. In point of fact, while it lasted, it was as real as typhoid fever and as unintentionally contracted.

But the war was twenty-five years ago and the supervisor is not in the front-line trenches and may well remark that the tale is interesting if true, but what is its significance to him in his daily work of guiding the efforts of a group of workers in a factory or an office? Let him look back over the experiences of the last few years and notice the number of times some man or woman whom he has assigned to some distasteful job has developed symptoms of an ailment which has made it unwise to keep that person on that work, especially when there were other workers who were not so affected by it and other jobs for these people which did not have this effect. In one plant where men and women worked on exceedingly fine adjustments, mercury-vapor lamps were installed because these lamps, which give light rays of a single color, reduce the amount of blur resulting from reflecting the multicolored rays of ordinary light and so make fine discriminations easier. The men liked the change and today, twenty years later, are still working under the green illumination and would resist any attempt to substitute any other light. The women, almost without exception, developed disabling ailments after a few days or weeks of its use. Some had painful headaches, some acute nausea, some developed skin eruptions, many were merely made too nervous and irritable to work. The nerve fibers of women are no different from those of men, and the management was at a loss to account for what resulted. The ailments were not at all alike, yet each woman blamed the green light for her trouble. As a matter of common sense the men and women were separated and the women allowed to work under ordinary incandescent-lamp light, and the troubles disappeared.

What was the real explanation? First it must be remembered that women take pride in the rosy color of their skins—so much so that when they do not have so much color as their pride demands, they buy it and apply it. But lipstick makes the lips appear red to the observer because it is composed of material that absorbs all the green and yellow and blue rays of ordinary light and sends back to the observer only the red rays. Since the mercury-vapor lamps have no red rays—nothing but green—there is no red for the lipstick pigment to reflect, and the lips, instead of being red, appear almost black, black with a greenish tinge. The nicely rouged cheeks become gray and ghastly greenish with a suggestion of the graveyard about them that rather nullified the purpose for which the Roses of Araby had been painstakingly applied. No woman working at the bench or disporting herself on the beach or sitting around the bridge table wishes to look like a three days' corpse. It is distasteful—something they have been brought up to consider essential to their happiness is lacking. Off the stage, men do not apply rouge and lipstick. They do not greatly care whether they have sallow or ruddy complexions except as it may indicate good or poor health. The women found a way out. The men have remained for twenty years with no ill effects.

One may venture to guess that if each woman had been placed in a separate cubicle, where no one could see her under the green light, she would have liked it as well as the men. That the ailments were emotionally self-induced through the processes of suggestion does not at all mean that they were faked, nor does it imply that this causal relation was recognized by the women or by the management. In fact, in describing this case to a class last year the writer was brought up with a round turn by one of the twenty women of the group who said, "That's all very well for theory, but I *know* my nausea was caused by those lights." So do I, but it was not through the direct action

of the green rays on her stomach nerve. Nevertheless, these things are as real and demand as much consideration as though they were eye injuries caused by grains of carborundum from the grinding wheel.

Although cases of the sort that we have been describing are exceedingly common, they are such that they lead the victim to the office of the physician rather than to that of the clinical psychologist or the psychiatrist. It is safe to say that at least half of the cases coming to the family doctor for treatment are of psychological origin, although the doctor himself, with little or no training in the field of psychology, does not recognize them as such. When the symptoms do not yield to pills and dietary changes, he dismisses the case with the somewhat lofty diagnosis of "imaginary" or the all-inclusive, but meaningless, term "nervous." That they are not imaginary, that they are the end results of psychological causes, escape reactions from conflict situations, is something that never occurs to him, something beyond the horizon of his medical training.

There is another sort of escape reactions, closely related to these mild everyday affairs, which lead not to the physician but to the psychiatrist. They are more serious than these attempts to get away from the minor annoyances of life in that they are psychological escapes from the reality of life itself. These, if not taken in time, may develop into the so-called "insanities" and to confinement in state institutions. We say "so-called insanities" because the psychologist does not recognize the term "insanity" as a scientific word. It is an indefinite generalization used in common conversation when the speaker is too cultured to use the more common and more expressive words "bugs," "nuts," or "coo-coo." Unfortunately the lawyers have adopted "insanity" and bandy it about the courtroom with a great show of scientific argument pro and con while the life of a human being hangs in the balance. If the defense can prove the prisoner at the bar was "insane" at the time he committed the deed, he will be allowed to live the rest

of his natural life as a guest of the taxpayers. If the prosecution proves he was not insane, he must suffer whatever consequences the law imposes for his misdeeds.

Incidentally, the logic of the law concerning insanities is worth a thought. If a man is "insane" and, therefore, of no use to himself and his family and a danger to society, we throw him into prison with others of his sort where we feed, house, and clothe him and hire guards to keep him from committing suicide—all at public expense. If he is sane and therefore might be capable of learning a new way of life, we kill him. It goes back to the church doctrine of free will and salvation or damnation. The church assumes that a man has a free choice as to whether he will do "right" or "wrong," and that if he chooses to do wrong, he is justly punished for not having chosen to do right. If, by reason of being possessed by a devil, he was not a free agent then he is not to be condemned for acts for which he was not responsible. The law says that a man is insane if he does not know right from wrong or is not able to understand the import of his deeds. If we take this literally, we are all insane. Is the judge "right" when he condemns a fellow man to death? Does he know what the consequences to himself and to his fellow citizen are when he does so? The answer lies in the realm of personal opinion, not in that of science. This accounts for the absurd situations in court which have gone a long way toward undermining the confidence of the public in the whole matter of the "insanity plea." The defense brings up an "alienist," the lawyer's term for psychiatrist, who describes the reactions of the man under observation and test, and who learnedly discusses the case in technical terms which neither the lawyer, the judge, nor the jury understand, and then the attorney says, "Is it your opinion that a man suffering from such ailments as you describe can know right from wrong?" The alienist answers, "No." The prosecution brings an equally respectable psychiatrist to the witness chair and evokes exactly the same description

of the symptoms. But when the question is asked, the alienist answers, "Yes." The net result is that the public thinks both men are paid liars and will sell their science to the highest bidder. Actually, both men are as honest and as conscientious as the rest of us, and their science is sound. In all points where science can be brought to bear they agree perfectly. When we depart from the scientific diagnosis and ask for their opinion about something which cannot even be defined, we are bound to get merely the reflection of their personal bias. What the prosecution does is to canvas the various psychiatrists until he finds one who feels that a person with the particular malady of the prisoner knows right from wrong while the defense hunts up one who holds the opposite view. The situation is sensible neither from the standpoint of science nor from the standpoint of law. The remedy lies in bringing the law up to date in the light of modern science. The psychiatrists on both sides agree, perhaps, that the man has "advanced dementia praecox with paranoidal delusions of persecution and grandeur." If the law wishes to say that such a man should not be electrocuted, the case would be fairly definite. Until the law adopts scientific terminology, the lawyer and the psychiatrist will continue to speak different languages.

There are many types and kinds of "insanities," but the commonest are the manic-depressives and the dementia praecox cases. The former are interesting because of the more or less regular cycles of ups and downs which typify the victims. All of us are subject to changes of mood from the joyous elated feeling of well-being to the gloomy feeling of depression. These shifts are normal and are matters of pleasurable reaction when things go well with us or of discouragement when they go wrong. Often these normal changes are helped along by digestive cycles. We feel fine today, and in our exuberance of feeling we eat two chicken lobsters and wash them down with an old-fashioned cocktail. Tomorrow the joyous mood is replaced by the

blue feelings of depression. This way of life may not be wise, but it is not an example of manic-depressive derangement. The manic-depressive case is not so simple. For one thing his spells of elation and depression last much longer than those of a normal person, and for another they far exceed in intensity any moods which the normal person is capable of experiencing. In the manic state the patient is superactive both mentally and physically. His activity, especially if restrained or thwarted, is apt to become violent and destructive. He may attack attendants or doctors, or he may injure himself or destroy property. These are the cases that have to be put in straight jackets or padded cells. This wild phase may last hours or days or months, but sooner or later it tapers off and is followed, usually, by a short period during which the patient is sane and normal. But this is a brief interlude which is followed shortly by the depressive stage in which the patient sinks into the depths of despair and inactivity of both mind and body. He sits by the hour in silent tears heeding nothing about him, difficult, if not impossible, to stir to action, and giving no sign that he hears what is said to him or in his presence. His whole body droops in dejection and if he speaks at all it is a murmur so low and inarticulate as to be classed as mumbling rather than as speech.

Manic-depressives obviously cannot be reasoned with or helped while in either the manic or the depressive state. In one they are too violent to listen and in the other too far submerged in impenetrable gloom to be reached. But during the "lucid" intervals something may be done if the case is of the sort that may yield to psychological treatment, and many are. Little by little the severity of the ailment and the duration of the spells may be reduced, and eventually a complete cure is effected and the person is restored to normal life. One of the necessary steps, if he is not to have a recurrence of the trouble, is, of course, to solve the conflict situation from which the patient was free while in either of the stages of his malady.

Not so easily handled is the other common sort of affliction, known as "dementia praecox." It was so named because it was formerly supposed to be developed only in early youth, at or shortly after adolescence. It is now known to come on in later years as well, although it still remains the most common of the forms of "insanity" which afflict those under twenty-five. It takes many forms and has many symptoms, but the commonest characteristic is that of delusional beliefs. In normal life we all know people who we say are suffering from delusions, by which we mean that they firmly believe to be true certain things which the rest of us believe to be false. The man who accounts for his lack of success in his work by saying that the foreman is "down on him" may be laboring under a delusion of persecution. It is more satisfying to him to believe that he is not given the breaks that other people around him get than it is to admit that he is in any way inferior to them in capacity. Except as it stands in the way of his recognizing and eliminating his shortcomings, it is a harmless sort of misbelief. It does not yield to logical argument or proof. The fact that no one agrees with him is merely evidence to him that these successful people naturally do not want to admit that their success is to be in any way ascribed to favoritism of those above them in rank. It is not at all uncommon to find that such people account for the supervisor's antagonism by saying that the boss is afraid to let him up or advance him for fear he will get the supervisory job away from him. This is so common a reaction that the reader will be able to think of many an example among the men in the various places where he has worked.

We may feel sorry for such a man, but we cannot class him as insane merely because he has a higher opinion of his own merits than we have. If such people were regarded as deranged, what would we do with the multitude of golfers who think their play is better than their partners think it is or of bridge players who always ascribe their

losses to the poor technique of their partners? Most of us would be under the suspicion of being on the border line of insanity if a mere overestimate of our own abilities were regarded as a serious symptom. Yet this same trait, carried to an extreme, may become exceedingly serious. The unstable individual who fails to make good in the field of ward politics may acquire the delusion that he is being held down by party bosses who fear that he will usurp their power. He may brood over his fancied wrongs until they absorb his every thought and feeling. Believing himself to be superior and the political principles for which he stands to be for the good of his community, he comes to regard the party bosses as corrupt menaces to the state. Finding no way to obtain justice for himself and retribution to his persecutors, he takes matters into his own hands and solves the intolerable situation by direct action with a gun.

Delusions of grandeur and persecution are part and parcel of the affliction of *dementia praecox*. For the most part the cases are incurable and tend to develop in seriousness as time goes on. One man whom we saw in a state hospital was there because he believed he had been cheated out of election to the office of President of the United States. He knew who had falsified the record, and he was on his way to Washington to assassinate the man who had stolen the job from him when he was apprehended and put in "protective custody." He called himself President Brown, and if he could obtain an interested listener, he would rant at length and in great detail about how it all happened. After a few years in the asylum, the presidency seemed a bit too confining to one of his talents, and he announced himself as president of the world, then as president of the universe. Still later he promoted himself one step further and under the title of "God Brown" he would tell solemnly how he created the world and all the inhabitants thereof. We asked him whether he had created the "hotel" where

he was then staying, and he hesitated for a moment, apparently deep in thought, and then replied, "Yes, I created this place—and, you know, I've sometimes been sorry I did." There is a deadly consistency to their delusions, and this man was bothered, in a befuddled sort of way, by the inconsistency of an omnipotent god having created his own prison.

These people live in a world of their own creating, even though it is not in the sense in which this man meant it. They do not see what we see, or, if they do, they interpret what they see as confirming the correctness of their distorted beliefs. Only a skilled and experienced psychiatrist can do anything with these cases, and the psychiatrist's success is limited to a small percentage of cures or even material reduction of the severity of the case. The supervisor may reach retiring age in a large corporation without having such a case develop, or he may have seen the tactful attendants in their white uniforms come and take one of his fellow workers to the hospital as a permanent ward of the state. In any event, it is not the extreme case that we as industrial psychologists are interested in. Only in order that we may better understand the man with normally distorted estimates of himself and of the people about him do we take this glance at the abnormal exaggerations of the same traits. After all, the difference between the "sane" and the "insane" is more a matter of degree than of kind. When the top sergeant thinks he knows more about military matters than the colonel, he is merely conceited, but if he thinks he is Napoleon, he is crazy. To the rest of the men in his company one belief is about as false as the other. And, since to argue with these people or to attempt to help them without knowing all the conditions which have induced their beliefs may make them worse, rather than better, the wise supervisor does not attempt to effect psychological cures but is satisfied to have an understand-

ing of them and so to be able to use them in some place where their defect may be a real virtue. For, after all, there are situations where an exaggerated opinion of our own merits is an advantage rather than a handicap. We are inclined to envy the Quaker who said to his wife, "All the world is queer but thee and me, and sometimes I think thee is a little bit queer."

CHAPTER 12

FATIGUE, MONOTONY, AND ACCIDENTS

Twenty years ago, while I was still a consulting industrial engineer, I made the statement that getting tired was more a matter of the head than of the muscles. Today I should change the wording somewhat, but the essence of the truth was in the original statement. From the time I was in high school until I was in my late forties, I did a modest amount of long-distance hiking. In high school days we considered twenty-five miles a good day's walk. In college we doubled it and did fifty-three miles in a little over eighteen hours. When I was forty, I was once bragging about these hikes when someone started singing, "The old grey mare, she ain't what she used to be." So one Saturday I rose to the bait and walked from Fall River to Boston and on to Lexington, sixty-three miles in twenty-one hours. Later, in Los Angeles, when I was in my middle forties, I walked forty-five miles and included in the jaunt Mount Lowe and Mount Wilson, each about 6000 feet high, though connected halfway up by a ridge trail. This excursion took exactly twenty-four hours. The point of this is that I have had ample opportunity to observe the effects of fatigue. Furthermore, my interest in the subject has remained keen, and I have been on the lookout to find in my psychological studies the mechanisms which would account for what I had observed.

Just what is fatigue? I think it should be recognized at the outset that it has two components: the physiological and the psychological. In some forms of activity one of these factors predominates and in others the other form is the more important. In order to understand how important an item the psychological factor is, it is necessary to

have an understanding of the nature of the purely physiological fatigue. For our information on this subject we are indebted not to the psychologist, the physiologist, the anatomist, or the physician, but to the chemist. These analytical scientists have studied the chemistry of muscular effort, the "fuel" and oxygen consumption necessary to produce the energy, the chemical changes that occur during the period of work, and the by-products which accumulate in and around the muscles as a result of work, much as the ashes accumulate in the boiler firebox or exhaust gases in the cylinder of an internal-combustion engine. The chemists' work with athletes who run various distances is illuminating. The 100-yard-dash man, for example, is developing for the period of slightly less than ten seconds approximately one horsepower, and for each stride that he takes he is accumulating about one gram of by-products in the muscle structure. But the race is of such short duration that he does not use up much oxygen while running. By the end of the dash, however, the accumulated by-products are in sufficient concentration to call for vigorous chemical action to neutralize them and turn them back into fuel form or into gases or soluble salts which can be cleared out and carried away. The system responds to this call by increasing the rate of breathing in order to get more oxygen and, by increasing the pulse rate, to circulate the oxygen and other chemicals more quickly to the muscles for the renovation process. The amount of oxygen required to restore the runner to normal resting condition is measured and is called the "oxygen debt" accumulated in the running of the dash.

The presence of these waste products in the muscles is the cause of the feelings of distress of which the runner is so conscious toward the end of his 100 yards. Spectators notice that the man no longer runs with so smooth a motion as he did at the start. His stride is clipped, his arms flail the air more, and his face is distorted as though he were actually suffering pain. But the importance of the

accumulation of these wastes is not in the matter of discomfort or pain; your game, determined athlete might ignore these symptoms, and, in fact, does so. Rather, it is in the fact that the presence of these chemicals in the working parts interferes with the entire process of converting fuels into work. If the products of combustion are not cleared out of the cylinder, the engine of your car will not develop power, no matter how good the gasoline in your tank may be. No amount of courage or resolution—"intestinal fortitude"—will avail to overcome the fact that these chemicals are there and are preventing further chemical action which would result in continued use of the muscles.

The 100-yard dash is short enough so that these by-products in the muscles do not prevent the runner from going the distance at his top speed from start to finish. In any race longer than 100 yards this is not true. If the sprinter figures that the thing to do is to run the first 100 of the 220-yard dash at his best speed, say in 9.8 seconds, and then continue on for the next 120 as fast as he can, he will find that he does not make his best time for the 220. The fatigue products accumulated during the first 100 yards will slow him down for the rest of the race, so that his total time will be poor. What he has to learn in all races longer than 100 yards is what rate he can set himself so that he can just hold it without change from start to finish. That will be the pace that will yield him best results, but at no time will it reach the speed at which he could run 100 yards.

What occurs is this. When he starts out, neither his pulse rate nor his breathing is enough above normal to take care of the fatigue products as fast as they are accumulating. If he works at top capacity, this accumulation begins to handicap him before his blood and breathing rate are able to master the situation, and, worse still, working under this handicap means working inefficiently so that he is never able to restore the balance without a

considerable slowing down of the muscular work through reduction in speed. What the experienced runner has to do, therefore, is find that speed which can be maintained throughout, but which will not pile up such an excess of fatigue products in the early stages of the work that they cannot be adequately taken care of when the heavier breathing sets in and held at less than harmful values from then on. The reason the speed must be kept constant at this maximum permissible value is obvious. If this safe speed is exceeded, the muscles become "clogged" and efficiency and speed are sacrificed. If the pace is allowed to fall below this highest safe value, time is lost that cannot be made up later. This holds good for all distances up to the marathon and, presumably, beyond.

This gives us an excellent opportunity to bring out the distinction between this physiological fatigue, which is purely a matter of physics and chemistry, and the psychological factor. Take the case of the mile runner as an example. Suppose he is capable of covering the distance in four minutes and sixteen seconds. If he is wise, he sets himself a pace which will cover the first quarter in sixty-four seconds. If he is somewhat inexperienced, his distress at about the end of the first 220 yards is such that he feels he is not going to be able to hold that rate for anything like the full mile. Every runner knows this feeling. He has not yet got his "second wind," which means that he has not yet established the balance between the making and the neutralizing of the waste products. If he yields to this feeling and slows down, he will report that the pace was more than he could stand. Actually, in the case we have assumed, that was not true. What he could not stand was the distressful feelings. If he gives in to them he is yielding to psychological factors—feelings, emotions—and not to purely physiological ones. This is one of Nature's provisions to prevent our overloading and damaging the body mechanism. The warning is given with a large degree of margin of safety, however. We "feel"

tired long before any damaging amount of work has been done. Some people feel tired much sooner than others, and some people pay a great deal more attention to these early feelings than do others. We all know people who "get tired easily," and we suspect that they are really no more tired than we are. To some degree we may be doing them an injustice. Undoubtedly some bodily machines are more efficient than others. Some blood streams are more sluggish than others; some do not eliminate the fatigue products so rapidly as others. But these differences are not so great as the differences we observe in the way different people react to the various feelings of fatigue.

We have seen in a previous chapter that some people live much more in the realm of their emotions than others. They live in their feelings. Your true Stoic is merely the one who has learned to say to himself, in the words of Milton, "To be weak is miserable, doing or suffering." He learns by verbal precept to ignore the promptings of his feelings. By refusing to give in to his feelings, he learns that they are much less imperative than he thought they were. He learns that when the first feelings of fatigue appear, he has in reality only just begun to tap his resources of energy, that if he ignores them, he can go on and on without their materially increasing. He learns that feeling tired is merely an excellent excuse for not putting forth further effort after putting forth effort has ceased to be pleasurable. That this is so is evidenced by the stockroom clerk who has been kept so busy all day that by quitting time he is ready to drop, but who, as soon as he gets outside, steps into the pitcher's box and pitches nine innings of strenuous soft ball. He *was* tired when the whistle blew, but he was psychologically tired. He was tired *of* the work not *by* it. If the work in the stockroom could have suddenly become as interesting and exciting as the ball game, his tiredness would have disappeared inside the plant as miraculously as it did outside. There

were probably no more products of fatigue in his muscular system at 4:30 than there had been at 2:30. The difference was that at 4:30 he was satiated with the work—"fed up." And we must not make the mistake of thinking that this kind of tiredness is not important in industry. We must, however, recognize that it is different from true physiological fatigue and has its origin in different sources. Either situation must be remedied, but the remedies applied are entirely different, and what cures one will have no effect on the other.

Actually, how many truly muscularly fatiguing jobs are there left in modern industry? The man Schmidt whom Taylor trained to handle forty-seven and a half tons of pig iron in a day was probably entitled to say at the end of his ten-hour stretch that he was physically tired. Even so, the fact that he was able to continue right up to quitting time indicated that there was probably no more physiological fatigue present at six than there had been at three. If he had been supplied with food at half-hour intervals, he probably would have experienced little difficulty in keeping on for another ten hours. But today we do not handle pig iron that way. If any such job is a regular part of the work of the plant, it is cheaper and more efficient to install a magnetic crane where one man does the work of ten and does it sitting down. The substitution of labor-saving devices has removed much of the physiological fatigue at the expense of introducing at least an equal amount of the psychological variety.

The difference between the job which does not bring on psychological fatigue and the one that does is the factor of pleasurable interest. When interest goes out of the work the symptoms of fatigue begin to take on importance and to occupy the focus of attention. Give a man a fascinating job, one that holds his interest keyed up to a high pitch, and he will work at it for twenty-four hours at a stretch and not complain of being tired. Edison probably got as much sleep in the course of a year as the rest of us,

tradition to the contrary notwithstanding, but when he got on a hot trail, he would stick to it for fifty or sixty hours at a stretch. Likewise, at a different level, I have seen men in the woods in the California mountain country, after their week's work was done, sit down to a game of poker at three o'clock of a Saturday afternoon at which they would still be playing at noon Sunday. Interest is the best antidote for psychological fatigue.

Taylor and his followers introduced the rest period of perhaps ten minutes in the middle of each shift and found that the workers did enough more work while they were working to more than make up for the time lost in the rest period. It is used in many industries today with the same happy results. It is regarded as a period in which the worker can rest and relax and recover from the effects of the fatigue which have been accumulating during the hours of work. There is no room for doubt that the beneficial effects are there. The production figures show it. But there is much room for doubt that physiological recuperation has anything to do with it. In most plants it is found that the hour during which the production is lowest and the most spoilage takes place is the hour in the middle of each long shift. It is not possible to explain this by saying that it is because the workers are tired. If fatigue accounted for it the worst hour would be the last hour of each shift, whereas actually there is generally an improvement in both factors as quitting time approaches. Also, if physical fatigue was causing the midday slump, a rest of ten minutes would hardly be sufficient to induce a chemical recuperation whose effect would last for another hour and a half or two hours. Furthermore, if the rest really had the effect of neutralizing the fatigue products the improvement would be felt at once, the day the innovation was introduced, certainly within the first two or three days. Actually the full effects of the introduction of rest periods frequently are not realized for three or four weeks after they are initiated.

We would understand better what rest periods really are and how they accomplish what they do if we abandoned the name "rest period" and substituted that of "psychological breaks." The reason the valley of low production comes in the middle of a long shift rather than at its end is that after a couple of hours at a job which is not absorbingly interesting, the worker begins to be "fed up" with it. This is heightened by the fact that he cannot look forward to any release for at least another hour and a half or two hours. Interest flags, attention wanders, and incentive is at a minimum. Introducing the rest period does not merely stop this decline and start the worker out again after his rest at a higher level; it prevents the occurrence of the slump in the first place. The satiation, fed-upness, does not set in because within an hour after the shift has started the workers know that it is only another hour until the break is due. Whether the idle ten minutes is used for smoking a cigarette, eating a chocolate bar, taking a soft drink, or just circulating around talking to others seems to make little difference in its efficacy. It is not what happens to the fatigue products during the ten minutes that counts. It is the pleasurable effect of looking forward to it and of looking back upon it that brings the results. If the morning passes more pleasantly, the work itself seems less distasteful.

Since it takes a certain time for the workers to find a satisfactory way of spending this unaccustomed ten minutes and a still longer time to learn to look forward to it as a welcome break in the long shift, we should expect just what we find, namely, that the improvement in production which frequently follows its introduction would not be experienced immediately, as it would if the rest were purely physical. It is because this factor of emotional accommodation to the rest period has not been understood by some managements that the experiment has been discontinued shortly after it was started, since no results were immediately apparent. No attempt should be made to evaluate its

success or failure until it has been tried out for at least three months. Remember what we said about the emotional resistance to change. This is a small change and the resistance may not be intense, but, as we have previously shown, new emotional habits are plants of slow growth.

After what we have said about fatigue, little need be said about monotony. If fatigue is largely a "state of mind," monotony is nothing but that. The job itself is not monotonous. I call it monotonous if it arouses certain emotional reactions in me. If someone else does not have these reactions aroused, he does not find it monotonous. This accounts in large degree for those sympathy-rousing phrases of political orators and magazine writers—"the deadly monotony of mechanized industry," "the soul-killing sameness of the assembly belt." They are the kind of people who would find repetitive work irksome. It would drive them to distraction to have to do the same thing over and over again. That is why they are writers and orators. But they are wrong in imputing this same feeling to others. Some people would be driven to distraction by the irregular, haphazard, unscheduled life the politician and the writer find enjoyable. There are men and women who prefer a job that is always the same, hour after hour, day after day. They want to be able to leave their work in the shop when they go home at night. They do not want to be called upon continually to make choices and decisions. A man who has worked seventeen years on the line in an automobile plant will tell you he likes the work, the surroundings, and the pay. He does not know what to reply when you ask him if he does not find it soul-killing in its monotony. He just says, "Well—suits me O.K." And if he wrote a volume on the subject, that would be the gist of it. It suits him, and so it is not monotonous. It does not suit the feature writer and the Sunday-supplement sob sister, and they are perfectly honest when they say that they tried it and found it intolerably monotonous.

If the work is a continual repetition and does not call up in us a pleasurable interest, we say it is monotonous. It takes enough of our attention to make it necessary to keep focused upon what we are doing, but it does not call for continual watchfulness, constant shift of adjustment of our actions to meet unpredictable situations. It takes enough of our attention to prevent our indulging in pleasant daydreams about the events of yesterday and the hoped-for triumphs of tomorrow, yet not enough to challenge our interest as a game. We find it monotonous. We do not recognize this as an emotional reaction of our own. We blame the job. To others the orderly repetition of sounds in regular cycles sets up a rhythm that their hands respond to as do the feet of a dancer to the rhythm of a swing band. They like it. It is not so much a matter of difference in intelligence as of difference in temperament, and temperament is a matter of emotional habit.

There is another problem in industry a study of which yields confirmation of what we have been saying about the importance of the emotional attitudes—accidents. It is wrong to think of an accident as “a malignant thing roaming about and looking for some unlucky man to happen to.” Accidents have causes, and most of them are caused by the people who have them. True accidents are very rare. If I am walking down Main Street on the right side of the sidewalk, where I have every right to be, and a manhole blows out under my feet, because of a gas leak in the cellar of the store I am passing at the moment, the broken leg that I suffer as a result is an accident that has happened to me. But if I see a car coming toward me as I am driving along the highway and notice that its radiator grille has been bashed in and all four fenders are crumpled, I give that car plenty of clearance because I realize that while one of those dents might have been the result of an accident, the four others were almost certainly the results of poor driving on the part of the man behind the wheel. Accidents do not keep happening to a man without some con-

tributing assistance on his part. The man with the bent fenders is not unlucky, he is just a man who drives in such a way as to get his fenders bent. It is not chance. It is direct cause and effect.

More often than we realize the cause is closely linked with some disturbing or distracting emotional factor which at least partially unfits the man for the task he is attempting to accomplish. It may be a momentary emotional upset, or it may be a continuing one in the nature of a mood or temperamental set. A man who is worrying over how he is going to meet the next payments on his radio, his car, and his wife's washing machine without having to default on the payments on his home, is not capable of giving his best attention to the work he is doing, whether it is driving a car or tending a punch press.

In one Midwestern city a motorman was found to be having fifteen times as many accidents as were shown on the record of another man of equal length of service on the same route. When he was called in for warning and correction, he was unable to assign any reason for the frequency of his mishaps. He realized the seriousness of the situation to himself, to his company, and to his victims, but in spite of every effort on his part the accidents continued. As part of the program of accident prevention he was sent up for examination to the offices of the company physician and company clinical psychologist. The medical man found him sound in wind and limb, with normal eyesight and proper muscular coordination, good hearing, and excellent general health. The psychologist found him of better than average intelligence and with an excellent cooperative attitude toward the investigation. Probing around for possible emotional conflict situations, however, he turned up the fact that the man had lost his wife a few years previously and had had to place his two children in a home where they could be cared for to the best advantage. The children were progressing nicely. The home was giving excellent training in school subjects, in morals,

and in manners, and he seemed very well pleased with the general results. The children, it was evident, were his chief interest in life. It was for them and their welfare that he was working, and he did not want to see them grow away from him for lack of daily association. However, the visiting period of two hours daily allowed by the institution came at a time when he was on shift, and as he worked six days a week, he saw his children but for two hours a week. Appreciating how much this meant to the man, the psychologist secured a special dispensation at the home so that the father could visit the children each evening for an hour just before their bedtime. Miraculously, as it seemed to both the motorman and the management, the man immediately dropped out of the high-accident brackets to somewhat below the average for the company as a whole. When his emotional conflict was resolved, accidents quit "looking for him."

In a hundred and fifty manufacturing plants, some large and some small, some in heavy industry and some in light, scattered across the country from coast to coast, a study of the time of occurrence of accidents was made over a period of from one to eight years. It was found that more accidents occurred between the hours of ten to eleven in the morning and three to four in the afternoon than at any other hours. That this is not a mere matter of chance is indicated by the fact that a similar study in France showed the same results. Nor is it chance that these hours of greatest liability to accident are the same as those we found were the hours of least production. If the low point in production cannot be laid to physical fatigue then the peak of accidents cannot be.

A further indication that accident rate is caused by psychological factors is the fact that the peak of accidents in the night shift occurs during the first hour. This seems to rule out physical fatigue entirely. It is just as obviously not traceable to psychological fatigue. The explanation given

by both management and psychologist is that the workers go to work still thinking about the activities they were engaged in just before reporting on the job. For the day shift a man gets up from his night's sleep, has his breakfast, and goes immediately to his work. For the night shift he gets up around three or four in the afternoon and has two or three hours of daylight in which to engage in various activities. He may go to a movie or a ball game, or he may work around the garden or play a round of pool or rummy before he has to show up at the plant. If whatever he has been doing happens to be especially interesting or exciting, he does not immediately lay it aside when he starts to work. A young man fresh from a visit with his girl, a woman who has just been watching her screen idol in a love scene, a man who has just won or lost six dollars on a card game—these people “have something on their minds” other than safety precautions around moving machines. They are at work so far as their bodies are concerned, but their minds are still outside the plant, and mind wandering, as we have said before, is an expensive habit.

The point we wish to emphasize in this chapter is the tremendous importance of the psychological factors in any consideration of fatigue, monotony, and accidents. No human being can keep his attention on one thing for eight hours in succession—or even for one hour, as a matter of fact. The best we can do is to prevent the attention from getting too far away from what we are doing and from staying away too long when it does run off. The only possible way to tie the attention to the job is to make the job pleasurable interesting. A job without interest does not merely *permit* the mind to wander—but *compels* it to. One of the rarest feats in big league baseball is for the pitcher to catch the runner napping off first base. There is too much interest in what he is doing to permit the man on first to do any daydreaming. He may get caught off

base by reason of having taken too long a lead, but he rarely gets put out because he is allowing his attention to wander to something more interesting than getting to second. If we could make our work as interesting as our play, we should hear little about fatigue or monotony, and we should reduce the accident rate by large percentages.

CHAPTER 13

MORALE—AN EMOTIONAL ATTITUDE

We are going to try in this chapter to point out how whatever we have learned in the preceding chapters may be put to use in a constructive way in the shaping of the emotional attitude of the working force under our supervision. We have stressed the importance of the little things, the small, perhaps childish, satisfactions on one side and the petty annoyances on the other. Strikes may arise over the large questions of wages and hours, but wages and hours were never yet the primary cause of the dissatisfaction which actually makes men strike. Men get peevish over constantly repeated instances of what they regard as lack of consideration of their welfare, their comfort, their "rights and privileges." What they really mean, although they do not know it, and would not admit it if they did, is that what has not been properly considered is their feelings. A gang of hard-boiled steelworkers can hardly go to the mat with the management on the grounds that their feelings have been trampled on. It would not make a good issue to put up to a board of arbitration. They can fight over the concrete matters of time and money and in the process of give-and-take which leads up to the settlement they can, and do, insist on these minor reforms which they have not been able to secure by less drastic procedures. As a matter of fact, they recognize that they lose more money during the prolonged strike than they can get back by the slight increase in wages which they may win. A 10 per cent raise does not make up in a year for six weeks of idleness.

What makes men act the way they do, either peaceably, even happily, at work, or truculently looking for trouble

and finding it, or making it? It is such a conglomeration of drives, motives, and purposes that neither the men themselves nor the psychologists studying their behavior can point to any one factor and say "This is the answer." Drives, motives, and purposes—what are they and what is the difference between them? In general and taken altogether we can say that they are the mainspring that makes the mechanism tick. To try to define them so as to separate them is not so easy. We might say that the "drives" are those purely physical affairs that are inherent in the tissues out of which we are made; they are "tissue needs" common to all animal life. Thirst, hunger, temperature adjustment, craving for activity, for rest, and for sleep, and sex—these are the better known drives that directly or indirectly impel men to do things. Thwart any of these, and complacency is disturbed. When this happens, men act. Hungry men are desperate men. Whole populations migrate to escape the rigors of a climate that is too hot or too cold for comfort. De Quincey's "Flight of a Tartar Tribe" tells in gruesome detail of the lengths to which men will go when deprived of water to drink. But in general, in modern civilization, the response to these drives is rather to a distant threat of future deprivation than to immediate needs. We work for wages because the wages will buy us food and shelter, but we are not conscious of these factors as forces driving us to show up at the desk or the bench each morning.

Somewhat closer to our everyday behavior are the motives that actuate us. Unlike the drives, the motives are mainly acquired rather than inborn. There is no full agreement on this score, however, for some psychologists maintain that, for example, the craving for recognition of ourselves as individuals is a native instinct, as much inborn as the desire for food. Akin to this is the "will to power" which the German philosophers have made so much of in the last thirty years, the desire for supremacy, for dominance over our fellow man. Nationally it makes for arro-

gant aggressiveness. In the individual it makes for the desire for low golf scores, high batting averages, rank in the army and navy, official titles in industry such as "superintendent" or "supervisor." It is almost impossible to say whether these things are born in us or whether we learn them because of the experiences of life. We find out very early that achievement gets us the things that contribute to that complacency which we all seek. We find that the respect or fear that we inspire in others helps us to the attainment of these things. Probably as foremen it makes no difference to us whether life has taught us these things or whether we inherit them as part of our structure as human beings. It is important to realize that they are universally present however we came by them. Like the drives, these motives are a deep-seated part of us and we respond to them without being conscious of the fact that they have dictated our acts.

Look at this simple matter of the powerful motive which impels us to demand personal recognition. It flowers as the desire for power. The greater the power and authority the greater is the recognition of our personal worth. We can understand that this is functioning in the men who accumulate immense fortunes which could not possibly be used for their own wants. If they use their money for vast estates and private yachts, it is for their prestige value, the envy of their fellow man who cannot have such things. Do millionaires get more pleasure from their miles of botanical gardens than I get from my little ten-foot flower bed? They do not even know what plants are on display. I know each sprout and blossom because I planted each seed. Or, suppose they use their money to buy securities which give them "control" of large corporations so that they can make more profits and thus buy into more and larger enterprises. It is not money per se that they want, but money as a means to greater prestige. You and I may not know them even as names, but their Newport friends do, and their financial rivals and associates do.

To win the regard and envy of their associates, some men are so powerfully driven that they will jeopardize their honor, and even life itself. Craving for this distinction gave us our Kreugers, our Whitneys, and our Musicas, as well as our still respected and envied "captains of industry," our "industrial tycoons."

The motives of business leaders are easy to see, but they are not so easily recognized in the man at the lathe, the woman at the bench. The abilities and the opportunities of these workers may not be so great, but their demand that in some way life must yield them individual recognition is just as insistent. None of us is so humble that he does not rise to the stimulus of individual recognition. In fact, the more humble the more important mere recognition becomes. The man sweeping the corridors of the office building is immensely pleased if the boss, as he passes out of the building, instead of merely saying, "Good night," says "Good night, Guiseppi." For most of the workers distinction within the plant is impossible. They are merely members of the gang, numbers on a timecard. But they all have intense personal interests outside, hobbies, prides, achievements. There is not time enough in the busy workaday world to sit down and talk to each worker about the thing he is most interested in, but it takes no time to say to a man occasionally, "Putting the boy in school this year?" or "I hear you made a 76 on the municipal links Saturday." The man does not analyze what has happened to him, but it would amaze many supervisors to learn what a difference it makes in the whole attitude of the man to his work and to management in general and in his feelings toward the company for which he works. It is not, as he may suppose, that you have shown a friendly interest in his boy or his golf score. It is that you knew and remembered that he had a lad of that age or that he, not somebody else, had made the golf score.

In a plant where this sort of thing is done as a consistent policy, there may be disputes and dissatisfactions, but there will not be strikes. In one plant with which I am familiar this has been the custom for thirty years, and it starts at the top with the plant manager and extends all the way down to the newest subforeman. If an agitator wishes to stir up dissatisfaction in this plant, the management will give him the run of the place and give him a free meal at the cafeteria. They will tell him that if he can show the workers that they would benefit by whatever he suggests, everyone will be pleased because the management and the workers would both like to know what it is so that it can be adjusted. This has actually occurred within the last five years, but the preliminary investigation made by the agitator convinced her (it was a woman) that this was no fertile ground for growing the seeds she had to plant.

I asked one of the younger foremen whether he had had any special instructions from above or any training in this matter of considering each worker as a personality and he showed surprise. Apparently he had never given a thought to how he acquired the habit, but he said, "No, I guess we just sort of absorb it after we have been here awhile. If you're promoted from the ranks, that's the way you have always been treated, and if you're hired in from outside as a foreman you soon see that it is the custom and just drop into it yourself."

He said the only case of "instruction" that he knew of was that of a callow and overcocky young foreman who had come in from another company and who started slave-driving tactics, treating his men like nameless machines. Some of the older workers complained through shop representatives to the big boss, who immediately called the man into the main office where he set him straight in short order. But his way of doing it was typical of the plant. He had the foreman sit down, and he talked of other things while they smoked a cigarette. Then he started by praising

the foreman's work as shown so far, and especially his zeal in trying to get extra-good results from his men. "But see if you don't get even better results by treating everyone of your men with the same courtesy you use toward me. After all, they are just as much entitled to it as I am and they need it more. I do not care, as a matter of fact, nearly so much as they do. That is the way this company has worked for thirty years and we find it pays dividends. Try it on and see how they rise to it." My informant said that one interview was all that was necessary. The manager, in demanding that the foreman consider the feelings of his workers, had considered the feelings of the foreman. It was not only "instruction," it was an object lesson and an example and an effective one.

Experience should have taught us long before we became adults that this desire for individuality and the craving for its recognition can be summed up in the statement that the one thing that you or I or the general manager or the night watchman is interested in is himself. Listen to any conversation between two men, two women, a man and a woman. What do you hear? It is not a conversation, it is a double monologue. Suppose two men are talking. The first speaker tells about the salt-water fishing trip that he took last Saturday when everybody on the boat except himself was too seasick to do any fishing. He goes on to tell what he caught, but the other fellow is merely waiting for a lull in the flow of words to break in with the experience that *he* had last summer when the boatman said it was too rough to go out, but they went anyway and nearly capsized trying to turn around to get back to the cove. At this point the first speaker goes on as though no interruption had occurred, with the description of the sea bass he was catching when his line broke. The breaking of the line lets the other fellow in with the rest of his tale about the shark fins all around their wallowing boat. And so it goes. Neither one in the slightest degree interested by what the other is saying but tremendously inter-

ested in what happened to him and blindly imagining that everybody else must be interested in it too.

There would be few "conversations" if the word "I" was lost from the language. Give us an audience and we will talk about ourselves. And nothing so pleases us as to find someone who appears to be really interested in what we are saying. Watch those around you and observe how rare such interest really is. Yet the surest way to the favorable regard of any man, woman, or child is to play the part of the interested audience. He must rate you as more than ordinarily intelligent since you have been more than ordinarily attentive to the detailed relation of the story he is most interested in. An appreciative listener is one of nature's rarest creations, and appreciative listening is probably the easiest way to obtain the good opinion of another, yet, to judge by the rarity of its use, one would think it must be the hardest. Understand, it is not enough to say, merely, "Yes, yes, go on." One must learn how to be really interested, how to ask a question that indicates an intelligent interest, how to throw in a comment that encourages further details. Interest is quite different from gossip or impertinent curiosity. The interested listener does not have to use any charms to "get" the other person to talk about himself. All any of us need is an opportunity. And the technique of being interested has to be used with caution and with due regard for time and place. Otherwise it becomes the occupation of the day.

There are three reasons for learning to be an appreciative listener: First, the respect with which we are regarded by other people is subtly increased. Second, we obtain information about the interests of the other man so that later we may throw out some apparently chance remark which shows him that we have distinguished him from the rest of mankind by recognizing his individuality. And third, although we seldom learn anything while we ourselves are talking, there is a bare chance that we may pick up some information by listening to what someone else has to

say. A member of one of my classes once objected to this technique, saying that if everybody adopted it, there would be no conversation possible, since each would be trying to play the part of listener. The reply is obvious. We need not anticipate such a situation until the millennium, and by that time none of us will be here to witness the event.

We will all talk on our favorite topic if we have the chance. This is easily illustrated by the following story from my own experience. A few years ago, toward the end of a course I was giving in general psychology, I made just such a statement about ten minutes before class was dismissed. At the end of the period I went to my office preparatory to going home to lunch when I saw one of my students standing at the doorway. I asked him what he wanted and he apologized for holding me up at lunchtime and then went on to say, "But, I noticed you said earlier in the hour, something about Lexington, Massachusetts. I take it from what you said that you lived there once." I replied that I had lived there five years, and he remarked, "It must be a wonderful experience to be familiar with those old historic sites where the country had its beginnings," and added that he himself had never been east of the Rocky Mountains and had often wondered whether any of the original landmarks of the historic events were still in existence. "Well," I said, "I lived within four hundred yards of the battleground which is still maintained as the town common with a marker showing where the embattled farmers had lined up. And there is a fine statue of Captain Parker with his famous words engraved on the base, 'Stand your ground. Do not fire unless fired upon, but if they mean to have a war let it begin here.'" And I went on to describe the Harrington house and the Hancock-Clark house and to tell him the real purpose of Paul Revere's ride, but at this point he grinned and said, "Thanks. I just wanted to see whether what you told us about how easy it is to get the other fellow

to talk would really work. Apparently it does." And this within ten minutes after I had told him! I still think he was one of the brightest students in the class.

Whole volumes have been written on the subject of the necessity to each one of us of maintaining a feeling of personal worth. Nowhere does this show more clearly than in the universal tendency to blame other people for our own shortcomings and failures—other people or circumstances beyond our control. We feel that it somehow lessens our own importance if we admit to ourselves or to others that misfortune came to us because of our own lack of judgment. Orientals make this a prime consideration in all the relations of life. In all their dealings with their fellow men they are careful to let the other man "save face," which, in our terms, means to retain his feeling of personal worth even when, under pressure of superior power, he is forced into or out of situations against his will. It is an excellent thing for the supervisor in modern industry to cultivate. It is what the poet had in mind when he wrote

Men must be taught as if you taught them not
And things unknown proposed as things forgot.

Franklin quotes this in his "Autobiography" when he is telling about how he learned as a young man that his cocky self-assurance was getting him nothing but resistance and opposition. As a young man he loved to display his knowledge and to lay down the law to others. He would win the argument but lose the good will of the discomfited adversary. He relates that when he changed his tactics and began to use such terms as "Is it not true?" or "It appears to me" or "It is my present belief," his statements were just as effective and his opponents much less under the necessity of contradicting him.

The Chinese have a saying to the effect that the man who resorts to blows to settle an argument admits by that action that he has run out of arguments. So it may be said that

the man who loses his temper in a discussion admits the weakness of his case. "If you are right, you can afford to keep your temper. If you are wrong, you cannot afford to lose it."

There is never any excuse for a foreman to lose his temper in dealing with his men. This is true under any and all circumstances, even in situations where he is dealing with a man who respects nothing but force. If the case can be handled in no other way than by resorting to blows, the man who has kept his temper, still has an immense advantage. Boxers and wrestlers know that when they lose their temper, they lose their skill. But in the more common instances where the argument remains verbal, it is even more true. The man who allows his muscles to get tense in an argument is at a disadvantage when pitted against the man who remains perfectly relaxed and calm. Temper begets temper. In anger things are said which, if admitted and allowed to pass, cause the other man to "lose face." The man who remains relaxed when calling another down has the other man at his mercy, the more so, the angrier the other man becomes. Relaxed, one may tell the other fellow wholesome if unpalatable truths which if said in a state of high excitement would arouse intense resentment. And when the other fellow has shot his bolt in a fit of hot temper, the relaxed boss who has kept his under control is in a position to say, "Now, let's see. I want to get this straight. Just what is it you are complaining about?" If you have ever had this trick played on you, you know that in the repetition the story loses most of its kick. You prepared the first story before you went to the boss. You probably rehearsed it many times, and it sounded plausible and effective; but when you had to repeat it, you could not use the same phrases, the same "cuss words," the same convincing order of statement. A good part of the energy you came in with has evaporated, and the restatement does not sound quite so convincing even to you. The supervisor who remains relaxed and calm

brings the other man's emotional level down nearer to his own; but the supervisor who loses his temper is allowing the other fellow to raise the boss's temper to the level of his. It is impossible for a supervisor to win an argument when tempers are hot on both sides. He has the upper hand by virtue of his authority and may overpower the worker and shut him up, but he should remember the old saying, "He that complies against his will is of his own opinion still." The man who is beaten down has lost face. Something of his feeling of personal worth has been taken from him, and this he resents. He may comply, but something of his loyalty has been lost in the process.

A foreman, and a good one, after hearing this doctrine for the first time in one of my classes two years ago was inclined to be more than skeptical; he thought it rather an amusing sort of unpractical academic idea utterly without value in the rough and tumble of plant existence. He had been a foreman for over twenty years in one of the largest corporations in its field in the East, a company employing men who could not by any stretch of the imagination be classed as timid weaklings. It was a fighting job, and he was known as a two-fisted foreman who would "take nothin' off nobody." Six months ago I met him during the noon hour, and he was as pleased as a child with a new toy. He said that after the classes were over he had got to thinking about this idea and had decided to try out the "relaxed" approach. To his amazement it worked with the toughest of them. And now, for more than a year he has made it standard practice, and he wanted to tell me that that one idea, if he had got nothing else out of the classes, was worth all the time he had spent in the eighteen hour-and-a-half sessions of the course. He had not softened up on his rigid discipline or on his habit of exacting from his men the full performance of their jobs; but his idea in the light of this experience now is that "if you use mule-driver tactics with your men, you turn them into mules."

We should give some attention to that word "consider" when we advocate that you consider the feelings of your men. When we say "consider," we mean "think about." Take the feelings of the men into consideration. It does not in any way involve pampering. A man may be the most strict disciplinarian in the plant and yet be the most considerate of the feelings of his men. He may be as fair, just, and impartial as a man of flesh and blood may hope to be and still maintain the good will of his men if, in administering his corrections and criticisms and call-downs, he does it without any show of feeling and in such a manner as to allow the men to retain a full measure of their self-respect. They will not be able to define the difference themselves, but they will respond to it and show their response in their general attitude toward him and toward their work.

Attitude is not a thing that is built in a month or a year. It is a delicate plant of slow growth. It takes years to build, but it can be changed from favorable to unfavorable overnight. Creating a favorable attitude among the workers must be done consciously, intentionally, and by plan. It cannot be left to chance with the expectation that it will be favorable. The experienced supervisor knows that some kind of attitude will develop whether he likes it or not. If he takes no pains to see that the attitude is favorable, he can rest assured that it will be unfavorable. If he does not guide the development of a favorable attitude, someone else will, and it will not be somebody who out of the goodness of his heart tries to shape the feelings of the organization in the best interest of the company. There are always hovering about the scene people who are disgruntled, who are chronically "agin the government."

The time to defend the organization against the destructive ministrations of professional troublemakers is not after they appear on the scene of action, but twenty years before. An organization can be made immune to troublemakers just as a human body can be made immune to

various diseases. A Filipino who has been fed for six months on a diet of polished rice, white bread, and pearled barley will contract beriberi whether he is exposed to it or not; whereas one who has been living on natural brown rice, whole wheat bread, and whole barley cannot be infected with the disease even though he sleeps with a diseased man and wears his clothes or has the diseased man's blood injected into his veins. So an industrial organization which has not been "immunized" will contract dissatisfactions and will be hostile to its management whether agitators work on it or not; but it will resist the efforts of the troublemakers if the entire supervisory force has for several years been consciously following the policy of considering the workers as normal human beings normally dominated by their emotional reactions.

The difference between a supervisor and a constructive supervisor lies in this factor of considering the men. The ordinary supervisor does what he is hired for; he keeps his department running and gets the work out. The constructive foreman does this as a matter of course, but he considers it one of his chief functions to build an actively favorable attitude at the same time. A fence which leans to the north does not fall to the south when prolonged rains soften the soil about the fenceposts and remove their support. The softening of the soil is a critical situation which permits the fence to follow the trend that the careless farmer has allowed to develop in preceding seasons. Things tend to fall in the direction in which they are leaning. The attitude of the men is a leaning in one direction or the other. The leaning may not be perceptible during times of no stress, but in human affairs there is bound to be leaning whether its direction is perceptible or not. So long as our industrial system involves the relationship of worker and employer, the leaning is bound to be away from management unless intelligent and persistent care is taken over long periods of time to ensure a favorable attitude. When the crises occur, when

there are depressions, red ink balance sheets, layoffs, lowering of wages, reduced working forces, management learns which way the leaning has developed. When at such times hostility and violence crop out, it is evidence that the management has ignored the cardinal principle that feelings are the essence of employee attitude. When, as happened in several companies in the 1938 relapse into depression, the workers voluntarily proposed vacations without pay, reductions in wages, and staggering of the work so as to keep all employees on the pay roll until affairs straightened out, one may be sure that the management of these companies had been alert for months and years before the depression to the need for ensuring a favorable leaning by the simple practice of careful consideration of the emotions of the working force.

CHAPTER 14

SELF-IMPROVEMENT

In the last chapter we pointed out a few of the applications that might be made in our dealings with others of the principles that we had discussed in the earlier chapters. Let us now consider some suggestions as to how each of us might apply these principles to himself—the one person in whom he is most vitally interested. Growth is a dynamic process whose continuance signifies youth, whose cessation indicates old age. When growth ceases, deterioration sets in. We go up the hill to the crest and start down the other side. There is no standing still, no dead-level plateau at the top. A man is old when he is no longer capable of taking on new ideas, whether the records show that he was born seventy-five years ago or only twenty-five. When a man or a woman has built up an unvarying set of responses to the affairs of life and is so satisfied with those responses that he will not exert himself to learn new and better ones, that person has not only reached the end of his development, he has already started down the gentle decline of slow deterioration. Mentally and temperamentally he is old.

That this sort of thing is so common may be in part ascribed to the definite break that is made between our years of schooling and our years of productive labor. In part it may be ascribed to a mistaken understanding of the word "education." Feeling that he lacks education, he decides that there is nothing for him to do but to make the best of things as they are and so he makes no effort to learn new ways of looking at life. What the man means who complains that he has not had much education is that he has had little *schooling*. It is perfectly possible that a man who

has not had much schooling may have a better education than the man who has graduated from college. Another factor contributing to this same lack of flexibility, this invariability of response, is the old notion that youth is the time for learning and that having let that period go by without making the most of it, it is now too late.

The old saying, "You cannot teach an old dog new tricks," has done more damage than a world war. We are told that in childhood and youth the "mind is plastic" while in maturer years it has "set." The best that can be said for this sentiment is that it provides a wonderful "alibi" for the man who would rather moan over the fact that he missed the boat than do the necessary work to make up for his lack. It is the excuse of the lazy man. Unfortunately for him it is not a valid excuse, since actually you can teach an old dog new tricks. We have a fox terrier eight years old, which corresponds to fifty-six in a man. When we acquired the dog, she was two years old and had been taught to sit up and beg for whatever she wanted. Finding that most people when introduced to the dog stoop down and say, "Shake hands" and that her lack of response made her look dumber than she really is, we undertook to teach her the new response. It took just five days of perhaps ten minutes a day to teach her to put up her paw on command. Recently we have varied the response, and now she will make a perfectly good Nazi salute when we say "Heil Hitler."

Not only has this old dog been able to learn these new parlor tricks, but she has taken on a whole new set of responses outdoors. In California she was a farm dog with half a county of back roads to roam over. In Philadelphia she has become a city dog waiting at the curbstone until someone says "O.K."; then she dashes across, running on ahead to the next crossing but always keeping on her side of the street. These are new tricks learned late in life.¹

¹ Since writing the above I have placed a flat-hinged "push button" on the front door within easy reach of the dog's front paw. Whenever she is outside

The reason that most old dogs do not learn new tricks is simply that no one takes the trouble to teach them. The bag of tricks they have is ample to meet all the ordinary situations of dog life, and there is no incentive to learn any new ones. And the same thing is true of man. By the time he is twenty-five, he is so well satisfied with his equipment for meeting life's situations that he continues to use what he has rather than bestir himself to acquire something new. Before a man will make the effort to learn new ways, he must admit that the ways he has might be improved—and that is something most of us are unwilling to do. Recognition of the lack must precede any steps toward improvement.

As we have pointed out in previous chapters, a man's capacity to learn increases until he is about fifteen or sixteen and then remains constant, or with so little loss that the decrease is negligible, until the period of actual breakdown sets in with old age. Even when the deterioration begins, it is usually a slow process, and the loss is hard to measure for the first few years after it sets in. We are talking to men in industry at this time, and for most of our audience this age of deterioration is beyond the years in which men are likely to be found in active jobs. Therefore when, as you read this, you think of men in your company who are classed as "old fossils," you may feel fairly well assured that they are old fossils not because they are too old to learn but because of emotional factors, because of an unwillingness to adjust to new conditions, a fondness for things as they used to be, a satisfaction with themselves as they are. It is not that they cannot learn, but that they will not. And this puts it up to each individual to take stock of himself to see whether he is in danger of settling into the well-worn grooves of custom and effortless inertia.

and desires to come into the house she pokes the device two or three times, and if very anxious five or six times. If we do not open the door at once, she repeats the ringing with really human impatience. She learned the trick in five lessons.

If he finds himself resenting the changes that are occurring about him and resisting their introduction he may know that he is on his way to becoming one of the old fossils himself. The world is changing all about us and changing rapidly, but not so rapidly that a man of fifty or of sixty cannot change with it if he will. He had the capacity to learn a whole system of living when he was fourteen, and he has just as much capacity to learn at forty if he will but use that capacity as he did then.

We have been talking somewhat vaguely about the capacity to learn to meet the new conditions as they develop, about self-improvement following self-examination. Let us get down to fundamentals. What sort of defects should a man look for in himself, and what should he do to eradicate them? They are of two sorts, and for want of a better description we may call them "emotional" and "intellectual." Of the two factors, by far the commoner and, in the writer's opinion, the more important, because less likely to be remedied, is the emotional. Under this head we should need to classify all such traits of personality as make for success and failure through their effect on other people, that make us liked or disliked. We should include here such items as the so-called "inferiority complex," the tendency to play the bully, the fiery temper, the feeling of self-pity, the self-satisfied aggressiveness of the boaster. These are not things that a man is born with. They have been taken on in the course of his earlier experience in life. If they have been learned, they can be unlearned. But first they must be admitted. And there's the rub. Can the braggart be expected to step to one side so as to take a look at himself—to see himself as others see him? Can he be expected to admit that his bragging is a challenge to others to set him down a peg, and so to belittle his efforts and accomplishments rather than praise them? Can he see that this trait has stood in his way and hampered his success? It is asking a good deal of him, we admit, but it is the sort of thing he

must do if he is not going to be satisfied to go on blaming others, rather than himself for his failures.

The first step, therefore, in self-improvement, is a survey of ourselves through an analysis of the way other people react to us. To this end we should learn the habit of making a brief examination of each success and each failure as it occurs with a view not to building up a feeling of personal triumph in the one case or resentment in the other, but to discovering what trait or factor in ourselves it was that brought the result. This must be preceded by an acknowledgment that the things that happen to us happen because we bring them about. Probably the only way we can learn in this world is by making mistakes and then avoiding them in the future. We shall not learn from our mistakes, however, unless we recognize them as mistakes and then trace them back to the defect in our character that caused us to make the mistake. If we will do this, there is some basis on which to start to improve.

But how does one go about eradicating an emotional habit that has been part of us so long that it has become one of our firmly established characteristics? Let us take a concrete example. Suppose it is a feeling of inferiority that we wish to be rid of. There are no miracles in psychology, no sudden conversions by which overnight a Caspar Milquetoast can be made into a Flash Gordon by the repetition of a formula or the making of a New Year's resolution. It is going to be a slow process, but it is a sure one if it is persevered in. Habit is in one respect similar in its action to a chemical balance, one of those delicate instruments with a knife-edge in the middle and a scale pan hung at each end. Put an ounce of sand on one pan and nothing on the other, and the loaded end of the beam falls until it touches bottom. The grains of sand are the little experiences of life which have built up in us the habit of being inferior—this pan is down. Like the inferiority habit which keeps a man "down," it will stay down unless something is done about it. Suppose with a

pair of tweezers we lift off one grain of sand. Has anything been accomplished? The pan is still down, and so far as we can judge, it is as firmly down as it ever was. Actually, it is not. It is resting with less pressure on its base by just the weight of that one grain of sand. But suppose instead of merely lifting it off the lower pan, we should drop it on the empty upper pan. The lower pan now rests more lightly on its base not by the weight of only one grain of sand but of two.

If we keep on taking one grain at a time from the lower pan and putting it on the upper one, we are continually decreasing the pressure with which it bears down on its base—and as yet there is no visible evidence that we have helped matters at all, since the pan is as down as it ever was. But there comes a time, a critical period, in which visible motion does take place. The pan begins to lift. The components of habit placed in the upper pan begin to bear down. A few more grains now and the pan that was up is now down and resting on *its* base. The other has risen free of support from below. The old habit has been broken and the new one established, but it is as yet only an infirmly seated tendency. A few grains transferred back again will reverse the balance and reestablish the old habit.

To return wholly to the subject of the feeling of inferiority and to abandon the sand and scale-pan metaphor we would advise making a small beginning. Tackle something which is easy of accomplishment, one of the very minor symptoms of the trouble. Let us say that you have been accustomed to yielding the right of way to others when walking on the sidewalk where cross streams of people meet. You are going down Market Street, and someone coming up Twelfth Street reaches the corner exactly as you get there. You have been accustomed to checking your speed to let him walk in front of you. Don't do it. Step right ahead and make him yield to you. Make a note of it and score up one infinitesimal gain. It imperceptibly reduces your tendency to subordinate yourself and imperceptibly lays the founda-

tion for the habit of self-confidence. You have been in the habit of taking a seat well toward the rear in church or in the theater. Now go a row or two farther up than you have been accustomed to doing and mark up another gain. You have been taking a back seat too long, and this becomes a sort of symbolic action. Do not try to forge right up to the front row the first time, or the tenth. Do these things gradually and hold each gain until it becomes easy before taking the next step. In time you will not mind going into a crowded place and parading up the aisle before the assembled throng. Score another gain.

Always treasure up these gains and revel in the pleasure they give you. It is a game you are playing and these are points toward a win. Little by little, harder tasks should be tackled. Speaking up in meeting. Do it in small groups first and in small ways but be conscious that you have done it. To tackle a job that is too big for you is to reinforce the old habit and to make future gains that much harder. It is slow steady progress that counts. It may take months, or it may take years, but there will come a time when you are sure that you have overcome the worst of your groundless fears. This is the time to beware of, for then you are apt to ease up. The new habit must become as firmly established as the old one was. Otherwise, when you relax your efforts, the old habit will creep back again. Actually, as you can see, you are not having to unlearn anything. You are merely learning a new habit that displaces the old one. Each gain in the new mode of behavior lessens the tendency to use the old one. In time you can hear someone say that the boss wants to see you in his office without thinking immediately that you are in for a call-down. You can get up in a club meeting and "speak your piece" without having your knees turn to cotton under you.

By this method you can build in any trait you may now envy in others. But you must not be in a hurry. Slow

but unremitting advance is the only method. One of the things that make Benjamin Franklin unique in history is that he got hold of this idea in its entirety and made it work for him all his life. In his "Autobiography" he tells how he worked it. In his old age someone asked him to what he attributed the fact that he was the foremost man of his time in a half-dozen different activities—science, finance, statesmanship, literature, general knowledge, invention. He replied that he laid it to a "little artifice" which he early adopted by which he attempted the "arduous task of achieving moral perfection." He describes how he listed the traits he wished to build firmly into his character, useful things that would help him to get ahead in the world.

To start with, there were twelve traits, and to each of them Franklin allotted a week of special attention. Whenever he caught himself in a failure, he took out his notebook and made a black mark opposite the trait and in the column marked for the day of the week on which the slip occurred. When he had reached the column for Saturday, he moved down to the next trait and concentrated on that from Sunday to Saturday, and so on down the twelve. The surprising part of the story is that he immediately began at the head of the list again. He knew it was a slow process. He says that for the first year his pages were almost wholly black with marks against himself, but he began to notice an appreciable gain and, apparently, to brag about it to his friends, for one of them suggested to him that he ought to add the trait of humility. And Franklin added it. He now had thirteen and he remarks that this had the virtue of giving him a thirteen weeks' course of training which made exactly four courses a year, by which we may see that he was not expecting miracles.

He tells us that after some years of this sort of trait book-keeping, he had the pleasure of seeing that his pages were almost as clean at the end of the thirteen weeks as they had been at the start, and then he felt that he no longer

needed the crutch of the notebook but could hold his gains by letting his now firmly established habits function with only a general oversight. It was his universal custom all his life to take stock of his successes and failures of the day each night just before retiring so there was little danger of his backsliding seriously without being aware of it.

Realizing as I do at this stage of my life how tremendously important is this item of personality building, I wonder that no one ever told me that it was a possibility, that I had in my own hands the making of any kind of a personality I might fancy. In grammar school, high school, and college they made valiant efforts to encourage me to accumulate facts, facts about Hannibal, about mica and hornblende, about the precession of the equinoxes, but no one told me I could mold myself to what pattern I might choose. Is it not odd that this most important of all factors for success and happiness is left to chance? Do you know of anyone today who is following any such well-planned system of self-improvement as Franklin invented?

Enough on the subject of the emotional traits. From what we have said you can build your own system if you will. How about the subject of general culture? Can a man who is in middle age acquire a general education regardless of what schooling he has had? Is it worth while, assuming it can be done? Take the second question first. Is it worth while? Forget about yourself for the moment and pass in review in your mind's eye the men whom you admire and envy, men about you who have been successful and have made their mark in the community. They may be as different as black and white when you compare them one with another, but one thing you notice they have in common—a broad general culture, a general knowledge of people and things, an ability to bring to bear on any subject that comes up for discussion a fund of information that makes you wonder how they got it and where they have been keeping it.

It is this broad base of knowledge that makes their judgments superior to ours. They have more information with which to make comparisons and reach conclusions. This is the sort of thing the schools attempt to instill into us, but they succeed in making the process so distasteful that most of it is lost for lack of interest. Furthermore the routine stuffing method of the schools makes factual learning so distasteful that most of us are glad to discontinue that sort of thing as soon as our diplomas are handed to us on the last day of school. Because these outstanding men have not allowed their intellectual curiosity to be killed, they have gone on with their program of accumulating knowledge after their formal schooling was finished.

Any man who is willing to devote fifteen minutes a day to the acquisition of new knowledge can secure for himself a cultural background that is superior to that given by any college course in the country. This is a statement that the lazy or indifferent man will reject with a scornful "Pfui!" When we say fifteen minutes a day, we do not mean fifteen minutes a day for six months, or six years. We mean fifteen minutes a day from now on with no artificial graduation day to put a premature end to the process. On a scheduled fifteen minutes a day a man can learn to read any foreign language he may select, he can familiarize himself with the best books in literature, with the fundamentals of any science or philosophy, with the chief events of history and their significance. He can open up for himself new horizons and learn to see behind and beyond the events of the day of which the ordinary man reads without real comprehension. He can attain a perspective which enables him to place these events, the men he reads about, the men he meets, in a meaningful picture. Instead of seeing them as isolated figures, he sees them in relation to others of their kind. And this is the material out of which good judgments are made. This is the difference between the man of affairs and the man who sits opposite you in the streetcar.

In general, I have met three common objections to this program, all of them feeble "alibis." First, there is the matter of time. Where is the busy man going to find fifteen minutes to devote to such a project? Second, this sort of thing requires exceptional intelligence and memory. Third, assuming you do get all this knowledge about the sky and the earth and the waters under the earth, what good will it do a supervisor?

The matter of getting time for such a program is hardly worth discussing. Of the three, it is the poorest excuse offered. Any man can find fifteen minutes a day if he wants to. He can read while he eats his lunch if there is no other time available. He can cut fifteen minutes from the time he devotes to the daily paper. He can take the last fifteen minutes after everybody else has gone to bed. He can get up fifteen minutes earlier in the morning. He can sit fifteen minutes in his office after the plant has shut down and get home that much later. He can park his car on a side street and sit in it for fifteen minutes if his family and friends will allow him no other time. When we think of what sacrifices some men have made to gain knowledge, we can have little patience with the man who offers lack of time as his excuse. Better to be truthful and admit that it is not worth the effort to you.

In the matter of lack of intelligence, one is inclined to be a bit more sympathetic. If you are feeble-minded, there is little use trying to pick up useful and pleasurable knowledge. It has been our experience so far, however, to find very few, if any, feeble-minded supervisors. One of the reasons for selecting men to act as supervisors is that these men have above-average intelligence. Any man who has enough intelligence to hold down a supervisory job has enough to profit by such a program as we suggest if he will only use it—if he will only use a respectable fraction of it. The only reason why this is a better excuse than the lack-of-time alibi is that we are half inclined to agree that when a man offers lack of intelligence as an excuse he is demon-

strating that he is not using what intelligence he has or he would not offer it.

The trouble, however, is not in the intellect but in the willingness to use it. With the man who really thinks that attainment of a cultural background is not worth the effort, we have no argument. Perhaps he is right. Perhaps there is truth in the old saying that what a man does not know does not hurt him. Certainly "Where ignorance is bliss, 'tis folly to be wise." We are not talking to the man who thinks that in the 1940's bliss is based on ignorance but to him who, finding himself plunged willy-nilly into the midst of modern industry, wishes to get ahead. To such a man we should point out the practical value on one side and the personal-pleasure value on the other of this matter of being "widely read." Let him once realize that his advancement in life depends as much upon the total impression that he makes on others as it does upon his special aptitude for the job he is doing, and he will cease to argue that general culture is not worth while. The facts of the case are that a man who has this general background is given credit for having more intelligence than perhaps he really has, whereas a man who lacks it is rated lower than he really deserves to be.

When I meet a man who can talk intelligently on almost any subject that I bring up, I put him down as one who has more than ordinary intelligence, and I unconsciously assume that he carries the same trait into his work and that with the intellectual curiosity that has made him sufficiently interested in many subjects outside his work he will have gathered like information about his job, and the job ahead of his job. Contact with such a man gives one the feeling of having met a superior personality. Such a man outgrows his job as a ten-year-old boy outgrows last year's suit of clothes. Neither he nor his superiors may be able to give an adequate reason why he is promoted instead of an equally able man of narrower horizons. His fellow workers think merely that he has had a lucky break.

There is no luck about it. It is an example of the psychological fact that we judge more by general impressions than any of us are willing to admit. And a fund of general knowledge is one of the basic factors making for a favorable general impression.

Suppose, now, that you have been persuaded that general culture is worth going after. How shall it be done in the fifteen minutes a day one has decided to devote to it? Obviously there must be a plan of some sort. We make no assertion that the following schedule has any sacred virtues. Any broad plan will do as well. We suggest this one because some men in tackling such a large program do not know where to begin and so never make a start. And we know this plan works because we have seen it used. First and foremost, the plan must be a handy and practicable one. The book to be read should be of pocket size, and most of the best works of the ages have been printed in this form to sell for less than a dollar. If one mastered the information contained in such a series as that of the Everyman's Library, or the Ariel Booklets, or even the five-cent Blue Books, one would have a broad foundation for a general cultural interest. But in order to avoid the aimless "browsing" that leads nowhere, we suggest selecting the books from different fields in some definite order, such as, for example, the following:

1. Biography
2. General science
3. Philosophy and religion
4. Travel
5. History
6. Fiction that has stood the test of time
7. Economics
8. Technical—in your own field
9. Poetry

Some of these fields do not interest you at all, but that is one good reason for putting them in the list. Other people

are interested in them and your interest will develop as familiarity increases. Furthermore, interest is interlocking throughout the list. Biography is not merely a story about a person. It gives a picture of the times in which the person lived and so makes any history covering the period more interesting. All sciences are related, and philosophy is an attempt to integrate the findings of science into a workable scheme of life. Books of travel take you to the places where the scenes of history and biography are laid and lend an interest to both. Good fiction is a moving picture of the distant times and places which are as much a part of the tale as are the people written about. Economics helps to make history understandable and explains some of the trends of our own times; it is tremendously affected by the findings of science and the industrial developments that follow new discoveries. And poetry—of what use is poetry to a machine shop supervisor? Probably it will have no value in the way of increasing his ability to keep the work running smoothly and the spoilage down to a minimum. But it does make a contribution to his understanding of some of the human emotions. Its chief virtue for you, however, is not in the shop but outside of it. Certain lines from classical poetry creep into the conversation of any group of cultured men because these lines express what the speaker wishes to say in fewer words and with better effect than would many times their number of ordinary words. At this time, with all the European capitals feverishly preparing for raids of bombing planes, it is interesting to be able to recall that Tennyson, years before the airplane was invented, prophetically wrote the lines

And there rained a ghastly dew
From the nations' airy navies
Grappling in the central blue.

Poetry compresses much thought in little compass and makes it live.

One man to whom I recommended this list balked on the poetry item with the statement that he never could make

any sense out of poems, and as far as he was concerned they were a total loss and always would be. I suggested that his distaste for poetry was entirely due to lack of familiarity with it. I suggested that he start with some poem that tells a story, something like "Hiawatha" or "The Princess," and that he get a book of Longfellow's poems and read them through whether he liked them or not, and then that he read Tennyson in the same way. I forecast for him that he would find that having read one, he would read the other with greater comprehension and greater pleasure, having now something with which to make comparison. He grudgingly agreed to make the trial and later shamefacedly admitted that he had been missing something all his life because of a prejudice. This was ten years ago. Last year he sent me a poem he had come across in some out-of-the-way place, and it was a gem. He had acquired an ability to appreciate good verse and to see the difference between poetry and mere jingles. Can anyone doubt that he has increased his horizons?

We have stressed only the cash value of this vague thing we call "general culture." We have suggested a list of nine classes of literature from which it may be obtained. We have not mentioned the greatest value of all—the pleasure value. The man who is somewhat familiar with the stars in their orbits, with the distances involved, the eons of time represented, enjoys a stroll out under the clear night sky infinitely more than does the man who sees in the heavens no more than he sees in the street lights of his home town. The man who has read the life of Napoleon better estimates the character of Mussolini or Hitler. Life takes on new meanings. Some degree of order can be made out of the chaos of the events of the day. Nothing is lost; much is added to the pleasure of living.

As we pointed out in the recommendations for improvement in the realm of the emotions, this is a slow process. No great miracle will be worked by reading one book under each of the nine heads. When the ninth has been read,

get another in the number one class and start down the list again with other books in the same classes in the order of whatever list has been adopted. The first book read in its field may have little meaning. The second begins to register because, although you may not realize it, something of the first book remains to shed light on the second. Interest has begun to develop and with interest comes retention. Background begins to develop, and you begin to use it without being aware of it. The virtue in having a list is that interest may begin to develop sooner in one field than in another, and without a schedule you would be tempted to concentrate unduly in that one branch of human knowledge, whereas your aim really is a broadening of your field of vision. The interest that you may develop for history, for example, will then serve as an incentive to get around to it again and so keep you more earnestly at the task of reading the branches for which you at first have less interest. If the schedule is adhered to, interest in the other fields will become as keen as the interest in your early favorite and may, in fact, displace it. This is mental growth, and as long as it is maintained, you will never grow old. And the man who devotes a quarter hour each day to increasing his store of knowledge can say truly that the end of each day finds him a bigger and a broader man than did its beginning.

Self-improvement—does a man face any greater responsibility in life? Within its scope are encompassed all of the virtues and all knowledge. It is a never-ending task, but it is also the greatest game in the world. There is no greater thrill than that of feeling that one is steadily gaining in mastery over his emotions, in knowledge of life and its meaning, in judgment and in wisdom. If self-improvement is seriously undertaken, the character grows as steadily, and as imperceptibly, as do the giant redwoods of California which, adding an inch to an inch year by year, finally tower three hundred feet into the blue to inspire us with the understanding that it is the small but steady gains that build the enduring structure.

APPENDIX

EXPLANATORY NOTE

Some of the industrial classes we have conducted in the Philadelphia district have wished to go on with the work in psychology after having attended the semester in which the work covered was substantially that covered by this book. The supplementary classes have been conducted as discussion groups in which the supervisors brought up situations that had arisen in their own experience from time, including those that were at the moment coming up for settlement or for a declaration of policy. In order that they might have for their files some suggestive notes of the fundamental psychological factors involved in the discussions, we prepared the following brief and informal discussions, each covering the principal item of the question taken up at the previous meeting. There is no continuity in the series, nor was there any in the classes, for the men were free to bring up whatever was uppermost in their minds at the time. These informal talks were mimeographed by the Pennsylvania State College office and given to each class member, together with a binder in which to file them. It is thought that they may be sufficiently interesting to readers of this book to warrant their inclusion here. They are intended merely as material which may in some degree point up some of the more general abstract matter presented in the text. Necessarily, and intentionally, there is some repetition which we hope will lend emphasis to the principles treated.

DISCUSSION 1. MOTIVATION AS A BASIS OF SUPERVISION

In the present-day high-pressure organization, where production has to be maintained at maximum efficiency and with minimum cost, is it still possible to maintain the good will and cooperative attitude of the worker? Do the insistence on meeting quotas, the prescribing of standardized routines, and the constant drive to hold down unit costs in the face of changing business conditions necessitate the use of impersonal hard-driving methods in which the crack of the slave driver's whip, though absent in physical form, must be present in its psychological counterpart in the consciousness of both the worker and the supervisor?

If the company for which we work is going to remain in business in the face of ever-increasing severity of competition, it must keep down costs so that the price of its service or its products will not exceed those of its chief competitors. Otherwise markets are lost or profits are

sacrificed. Either result will eventually eliminate the organization from among the ranks of going concerns with consequent loss of employment for all members of the company from chief executive to the lowest grade worker. To keep these costs down necessitates expansion—immense organizations with a more exaggerated division of labor than is at all possible with the small one-man or one-family companies of times gone by. This tends to separate worker and supervisor and to place upon each a load of routine duties that must be met on schedule every hour of the day, every minute of the hour, or the orderly progress of work is destroyed with resultant demoralization of processes and prohibitive increase in costs. Under these conditions can any but the most impersonal relations be maintained between the supervisory personnel and the workers? In holding the worker to exacting and rigid compliance with seemingly almost unattainable requirements of performance, can good will and the cooperative attitude be fostered in any real sense?

Before we can render any satisfactory answer to these questions, we must determine what it is that motivates any of us to do his share of the work of the world. Unless we recognize what it is a man works for, we can have little hope of building anything resembling morale in our organization. We might as well expect to drive an automobile without knowing that it is guided by turning the steering wheel, accelerated by stepping on the gas pedal, and stopped by applying the brakes. Why will a man or woman give up half of his waking hours to the performing of arduous, often even unpleasant, duties when he might be doing other things much more to his liking? It is not enough to say that he does it for money with which to buy a place to sleep, clothes to wear, and food to eat. Men will work even when these things are guaranteed to them without any exertion on their part. If we believe the Horatio Alger type of writer, we may ascribe it to a sense of duty to humanity, a loyalty to a cause or an organization, compliance with the teachings of a philosophy or a religion which holds that only he who thinks of others first and himself last, if at all, will reap a reward in this life or in a life to come. Actually, it is safely conservative and within the truth to recognize that no man works, or does anything else, except for his own benefit, his own peace of mind, his own "complacency." The drafted soldier attacks the enemy trenches at the risk of his own life because the consequences of failure to do so are more uncomfortable to contemplate or experience than are those of advancing to the attack. The man who volunteers to fight for his country does so because, owing to his past training, he would lose his complacency, his "self-respect," if he refrained from offering his services. A man works for a corporation because of what he gets out of it. He works harder because he expects

to get enough more out of it to repay him for the effort. He works "for the good of the company," for the benefit of the group, because he expects in return greater reward in money, esteem, or personal satisfaction.

Such being the universal law, how are we to make use of it in the handling of our daily contacts with those who work for us and for whom we work? The job of the supervisor is to get others to do the things which must be done if he, the supervisor, is to fulfill the expectation of those for whom he works. He is struggling all day to get others to do the things he wants them to do. Always and to all of us there are present two alternatives between which we must choose, two courses of action, one of which must be selected. If both of these are unattractive, repellent, we shall choose the one that, all things considered, appears at the time to be the less undesirable, the less repellent, the lesser of the two evils. If both alternatives are *desirable*, we choose the one that appears the more so. On no other basis is a choice, an exercise of the "will," called for. If one of the alternatives is entirely undesirable and repellent and the other entirely desirable and attractive, no choice is called for. We automatically respond by accepting the desirable and avoiding the undesirable. Disturbing emotions arise within us only when the two alternatives are equally attractive or equally repellent. Under these circumstances a choice is impossible, and our complacency is destroyed by the conflict which cannot be resolved until the equality is destroyed by making one alternative more desirable or the other more repellent. Unrecognized though this state of affairs usually is, it is the basis of successful direction of the activities of those who work for us, of the making of a sale, of the raising of a subscription, of the rousing of the rabble to riot, or of the masses to a patriotic fervor. It is the essence of persuasion and of supervision, and it must be taken into account if success is to be attained in the handling of men.

As supervisors we have the choice of which of the two methods we shall use to secure results from our workers. Shall we consider the work, as such, as an undesirable and repellent task, something to be avoided if possible? If so, our mode of action is to make avoidance of the task still more repellent than the performance of it. In other words, we use the fear motive. Do as I say, or we shall get someone who will. Do your work or lose your job. The essence of this technique is tied up in the two words "or else." The user of it is never a leader, always a driver. Much of the world's work is done with the handle end of a whip in the hand of the foreman.

The second method which the supervisor may use if he so elects is that of making the desired course of action more desirable, rather than

making failure to follow it more unpleasant. Two lines of action are always open, the one the worker wants to follow because he is familiar with it or thinks it easier, and the one you want him to pursue. Both are assumed to be satisfactory, if not actually pleasant. The virtues of *his* way are freely admitted. The advantages of *your* way are displayed in such a way as to make them more attractive. Perhaps it is presented as the wished-for opportunity to demonstrate ability, energy, loyalty, ambition; to attract attention of the higher-ups who are looking for men to promote. Perhaps it is made more attractive by the flattering inference that the chance is being offered to him because not everybody could handle it. It may be presented in the light of a game, a challenge to his sporting spirit, something to "lick." The point of difference in this method is that fear is not a factor. No mention is made of any penalty for refusal, any consequences of failure. The virtue of the device is in its effect on the emotions of the worker. If the new method is "sold" to him, he wants to do it. He is embracing an opportunity. Wanting to do a thing is fundamentally different from fearing not to do it. In the one case we have morale, good will, cooperation. In the other, we have compliance accompanied by smoldering and suppressed resentment.

Obviously the opportunity to use the artifice of enhancing the desirability of the course we wish our workers to follow, rather than making them choose the lesser of two evils, is not lost just because the tempo of the work is increased. As a matter of fact, the artful user of this technique can paint in attractive colors even the very factors which enter into the speed-up and the finer subdivision and specialization of the work. We have but to keep in mind the underlying principle that self-interest is the driving force and then so present our "orders" that they appeal to this self-interest. The worker will do the rest and will feel that he has made voluntary choice in so doing. Actually, of course, he is not a free agent but he does not know it. If the analysis of his interest has been correctly made and if the case has been so presented to him as to appeal strongly to this interest he can do no other than choose to do that thing, yet he will feel throughout that the choice has been his own. This is leadership.

One factor in the application of this method must be kept in mind. It is not a device which can be used one day in the month and forgotten for the thirty other days. The groundwork for its success is laid many days, weeks, and months, before any emergency arises. Morale, confidence in management, and the cooperative spirit are not built into an organization suddenly. They are the fruits of long and consistent policies. The fruit of an orchard may come to full ripeness and perfection in the last week of the season, but its excellence depends

upon the plowing in the spring, the cultivation throughout the summer, and the maintenance of adequate moisture at all times. The morale of today was built last year, every year, in fact, for the past decade or more. It is created by making the desired course of action continually more attractive and more satisfying than the undesirable conduct.

DISCUSSION 2. CONSTRUCTIVE SUPERVISION

(The first paragraph summarizes the incident related in Chap. 4.)

In 1920 the writer, while traveling on the Overland Limited, made the acquaintance of a highly intelligent, well-groomed man who had a unique occupation. Being a reticent and self-sufficient sort of individual, he was a bit difficult to draw out, but we finally wrung from him the statement that he was one of three men doing a special job for a large steel company, each in a prescribed territory covered by the company and its subsidiaries. As he expressed it, it was his job to find the thirty-third man and to make sure that he did not get away. With due encouragement he explained that his company believed that about three men in a hundred are of outstanding capacity—one man in thirty-three. The capacity might be latent and undeveloped but that made the search only the more interesting. If the searcher believed that he had discovered an undeveloped genius, it was part of his job to see that the man had ample opportunity to demonstrate his talents. The search was not confined to any wage or salary level nor to any rank or position. The man might be a yard-hand, or he might be a superintendent. All that the company insisted upon was that no such man be overlooked and so allowed to escape from their employment. The hunter of "thirty-thirders" told me that it was not considered a serious error on his part if he picked a man for observation and reported him as a probable thirty-thirder only to find later that he had been wrong in his judgment and that the man did not have what it takes to stand out from the ranks of the company's employees in general. But his superiors did consider it a serious failure if he overlooked any such man and allowed him to become dissatisfied and leave their employ either for that of a competitor or to enter some other line of work. If such a man, unrecognized in their ranks, later and in a more favorable or stimulating environment, developed into a leader or researcher, a developer of new processes, an organizer of new and valuable systems of procedure, they felt that they had not only lost the advantage that his work would have conferred on their own company, but that they had handed this advantage over to some other organization and now had him as a competitor.

Put in another way, this company realized that all too often they and their superintendents and their supervisors had been allowing unmined

gold to remain undiscovered below the surface of their property while they walked back and forth over it daily entirely unaware of its presence. Their error would be comparable to that of a man farming such gold land and then selling the property as poor farm land only to have the new owner discover the riches beneath the surface.

The introduction of this practice of being on the hunt for talent does more than merely discover latent aptitudes which might otherwise be overlooked and lost; it involves changes in attitude throughout the organization. In companies which do not realize that their greatest asset is the skill and ability of the members of their organizations, not only is incentive for the discovery and development of subordinates lacking, but a positive premium is set up for exactly the reverse procedure. Superiors fear the discovery of outstanding capacity in their subordinates. Upon seeing evidence of such aptitude, the boss finds it to his advantage to protect his own job by throwing obstacles in the way of the men below him. He fears that if he brings such a man along as fast and as far as his capacities will take him, the management may find it a measure of economy to fire the boss and hire the younger man to fill his place at a lower salary. One can hardly blame such a supervisor, if his fears are well grounded, for stealing the credit for any superior performance of such a subordinate, for rejecting his innovations and suggestions and later appropriating them as his own in order to obtain the credit himself in the eyes of his own superiors. The effect of such a practice is destructive of all morale and all technological advance. Such an organization suffers from stagnation and dry rot. Men who have their creative ideas stolen learn to keep them to themselves. Such a policy is a permanent red light on the highway of progress.

Contrast with this the attitude of an organization where it is known that there is continuously and persistently on foot a search for talent which may be developed into ability, where the management regards the development of the men and women under his direction as the greatest service a supervisor can perform. In such a company the man at the lower levels knows that things that he discovers and reports, ideas that he advances, suggestions that he makes will be relayed to the higher-ups as his. He knows that in passing the credit on to him the supervisor is not only in no fear of his own job but is obtaining with the management the greater credit of having developed a man capable of originating such improvements, and, in addition, the credit of being able himself to recognize the merit of the suggestion. Credit, in such an organization, cannot be lost by either party to the transaction; it doubles in the process of being passed on, and an equal amount finally remains with each. Such an organization has morale—and it grows.

In an organization in which the supervisor's duty ends with seeing that the work of his department is done efficiently and on time, that schedules are carried out and quotas met, a foreman may be a man of mediocre attainments, a routine-follower. In the other type of company, where full opportunity for development is accorded to the entire personnel, it requires, and produces, a higher type and quality of supervision. What every alert management is seeking, and what every supervisor should be encouraged to look for and develop, is the individual who can see unsolved problems all about him, problems which the routine man lives with year in and year out without being conscious of their existence. The man who is in the best position to see these problems and appreciate their importance is the man who is closest to them. The valuable man is the one who can see these problems and devise methods for their solution. The power to analyze, diagnose, and prescribe is as priceless a trait in the industrial man or woman as it is in the physician. The trait lies dormant in most men and women because of lack of incentive to develop it. It is not encouraged in our school system with its too large masses and its routine-minded teachers, and it is not fostered in our industrial system because of lack of reward or appreciation for its manifestation. Mere knowledge of the duties and requirements of the job is no longer sufficient. The carrying out of the smallest details of supervision is a necessity and is one of the rudimentary requirements of the good overseer. The creative supervisor must have this quality and, in addition, that of looking for the real problems surrounding his job, and of training those in his charge to take the same attitude to their work. Management is hunting for men of this sort with the same eager persistent energy that the forty-niners showed when searching for gold in the hills of California and, like the prospector, their search must be successful if they are to survive.

DISCUSSION 3. SUPERVISOR AND MANAGEMENT

In the two previous discussions we have attempted to set forth certain fundamental truths concerning the functions of the creative type of supervision in which one of the chief aims is the development of latent and perhaps unsuspected talents in those working under the direction of the supervisor. We have attempted to show that in the last analysis we all work for our own self-satisfaction and betterment and that the supervisor should utilize this factor as an incentive and encouragement making for freer and greater self-development in his workers. We have indicated that the management, in these days of stress, realizing that the position of their company in the next decade depends on the development today of the abilities of those now in the lower levels, is

actively on the lookout for supervisors who can do this constructive work.

There are implications in this sort of industrial relations which must be clearly understood and frankly faced, both by the supervisor and by management. In this newer view of the responsibility and opportunity of the supervisory ranks, management finds itself in the same dual relation that has always been a part of the position of the supervisors themselves. Supervisors have always occupied the middle position between management and worker, representing to management the needs, defects, and virtues of the working force. They are the medium through which management makes its contacts with the workers. But to the workers the supervisors represent management. The workers are aware of the attitude of management only in the acts of their immediate supervisors. Only in rare cases of emergency is there any direct contact between the higher-ups and the workers. In the usual routine conduct of business the supervisory force serves as a two-lane highway with traffic passing in equal volume in both directions. One of the defects of the old system, still in use in some corporations, but fortunately rapidly passing into the limbo of discarded practices, was that this was not the case, and supervision was a one-way street with orders going out from management and little or nothing coming back except in the case of trouble.

Time gallops on, but human beings in the mass learn slowly. We cling to what is familiar and adjust only painfully to the changes that time brings. The industrial revolution did not occur in a day or in a decade. The adjustment to mass production was slow and painful, and many errors were made in the process, and many more will be made as the development continues. Changes in the emotional attitudes of a people are as slow as the movement of a glacier, and as irresistible. In steep places through narrow rocky bottlenecks along its path, the glacier necessarily moves faster in answer to the pressure from the slow-moving mass behind it. Just so, in times of world-wide unsettlement, the movement of man's adjustment seems to be visibly accelerated. Conditions abroad and the rise in the world of new philosophies and new systems have jarred us out of our complacent acceptance of the slow progress of evolution and forced us all to take stock not only of where we are at the present moment but where we are going. It is a wholesome sign when a nation begins to study its trends and to anticipate and direct the forces of the change. These forces are beyond the control of any man or any body of men. They are the natural results of changes that have gone before, and as such they obey natural laws as much as does the rising balloon or the falling apple. Intelligent adjustment to these uncontrollable drifts bends them to our advantage.

Resistance to them results in disruptive destruction as truly as would an attempt to prevent the waters of the Mississippi from reaching the sea.

When the conduct of business enterprises was a one-way street, the methods employed necessarily developed antagonism of interests and the division of commerce and industry into hostile groups whose aims and purposes were seen as incompatible. What one group gained the other must of necessity lose. Under such a philosophy all parties were not only unreasonable but unreasoning. Emotions were dominant and reason subordinated. In a half century of such a system people learn not only to adjust to the existing relations but to accept them as inevitable. The present decade has been one of painful readjustment to new concepts and new relationships.

Some of us are fortunate enough to be connected with organizations that have made the readjustments without undue haste, yet without undue resistance. Foresight and anticipation have led such groups to accommodate themselves to the changes as they occurred or even before they developed. The "horrible examples" of the reverse procedure elsewhere in the world have brought a realization here on all sides and at all levels that our system is worth preserving, and that if it is to survive, it must be on the basis of cooperative helpfulness. The mutuality of interests which has been preached by theorists for years has become a practical necessity and an almost unconsciously adopted policy. In any organization there are some who, having been led through long years to regard the old order as a fixed law of the universe, have difficulty in accepting the new attitude as anything but a fleeting phase, or even as a false front behind which to carry on the ruthless policies of decades gone by. They do not understand that the new emphasis on the human factors in industry is not something adopted as an expedient but is the result of new knowledge, a new viewpoint, a new understanding. Call it "enlightened selfishness" if we must, to conform to our idea that all of us act for our own best interests, the fact still remains that it is enlightened and that as time goes on it will be more so rather than less.

Under the old order a supervisor who had the normal amount of common intelligence would hesitate to develop one of his workers to the point where the worker might be capable of superseding the supervisor. Under the old system experience had taught such a supervisor that the management would rejoice in the opportunity to make a reduction in the pay roll by replacing the more highly paid foreman with his apt pupil whose services could be had for possibly half the weekly pay. Today management sees in such a policy negation of progress, the destruction of morale, and the selling of future inheritance for a poor mess of pottage. For the organization of tomorrow as truly

inherits from the organization of today as does one generation inherit from another. Management knows that if a supervisor develops a subordinate to the point where promotion is the next inevitable step, when the supervisor recommends such promotion, he is doing so for the general good of the company and at a substantial sacrifice to himself in the conduct of his own department. Replacement of the able and well-trained expert by others who are but apprentices may be a double gain for the company as a whole, but it looks like a loss of efficiency in the single department. In fact, it is such a loss, but it is a temporary one, and it is understood by management to be such. Temporary increase in the cost of handling the work of the department is set down as the price of continued progress and as an insurance against future incapacity in the ranks of management itself. The supervisor who feels that he loses more credit by the temporary increase of his operation costs than he gains by his contribution through the development of his personnel either has not kept in step with the new developments of his time or is finding an alibi with which to excuse himself from the extra effort involved in the more constructive and creative factors of supervision in the modern order.

It is in this new necessity for adapting itself to the long look ahead that management now finds itself, as we said, in the same duality of interests that has always faced the supervisor in the discharge of his own duties. And modern management has met the issue squarely and intelligently, recognizing that there is no great gain without some small loss. Secure in the knowledge that this is increasingly the policy and desire of modern management, the supervisor who twenty years ago would have been foolish to give any thought to the development of workers can now indulge in that pleasure not only without fear of loss to himself but with assurance of an increase of prestige and standing in his organization. We speak of it as indulging in a pleasure because, when all is said, the greatest pleasure a supervisor takes in his work is his ability to think and to say, when he sees one of his old proteges climbing the ladder of success, "I gave that fellow his start. I knew he had it in him and I helped to bring it out." The more such men can be traced back to the training of a given supervisor, the greater is the value of such a supervisor in the eyes of management—and the greater is his pleasure in his work.

DISCUSSION 4. PROPAGANDA

Advertisers recognize two prime purposes in all forms of advertising, whether by magazine, newspaper, radio, billboard, house-to-house canvassing, or other means. In one form they aim to arouse a desire and with it a resolve to buy. Some particular article is described and

made as attractive as possible—a dictionary, an electric razor, fog-piercing headlights for your car. If the advertisement is successful, the reader goes to a store and asks for the article, and herein lies the defect of this method. He may buy the electric razor of a competitor of the advertiser. If the competitor is also advertising in like amount, the breaks may even up and each may get some benefit from the other's displays. The main point is that a market for the goods has been created. The other class of advertising, sometimes called "public-acceptance advertising," aims to establish prestige for a brand, a manufacturer, a chain of stores. It assumes that the public will at some time be in the market for the product or the services which the company provides. When the time comes for making a purchase, they wish the consumer to turn without a conscious thought to the goods which bear the familiar name. No single product is described, the virtues of no particular item are extolled. The attempt is to build by slow degrees a halo of respectability, solidity, quality, supremacy which will make it easier for the salesman at the counter to sell goods bearing that name than those of a less well known brand. The word "Prudential" is printed across a picture of the Rock of Gibraltar. "Westinghouse is the Electric House." On the radio Major Bowes uses the former method with descriptions of the virtues of his wares; the Ford Sunday Evening Hour uses the latter method with little or no direct reference to the product which it is hoped will in time become associated with the excellence of the musical program offered.

One thing the two methods have in common: They both depend for success upon arousing feelings of one sort or another in the prospective purchaser. In the direct appeal the feeling must become intense enough to bring about a fairly prompt action response, otherwise the effect of that advertisement is largely lost, and the work has to be done all over again with a later insertion. To some degree at least it is an "all or none" response. On the other hand the feelings of the public-acceptance method are of such low intensity that the one in whom they are aroused is not conscious of them. When he buys a Buick in preference to a Pontiac he does not know how much he has been affected by having seen a thousand times the words, "When better cars are built, Buick will build them." After all, that is no reason for buying a Buick, nor is the familiar challenge, "Ask the man who owns one," a reason for buying a Packard. But these things predispose us, through our milder emotions, to these cars. Other things being equal, we shall be more easily persuaded to buy these products than to purchase some other with which we have no such comfortable associations.

The important distinction to keep in mind is the factor of immediacy. The public-acceptance method aims at nothing immediate. When

I buy a General Electric product I am responding as truly to the General Electric "propaganda" of twenty years ago as I am to the advertisement in yesterday's paper. Not one Packard driver in a thousand could tell you of any mechanical detail which makes that car superior to others in the same price range. He was influenced to buy the model that he has by a campaign covering thirty years in which he has been taught to *feel* that the car is a quality product with a prestige value. Feelings determine our decisions. We justify them with reasons later.

Presidents are elected by the method of direct appeal, but adherence to an economic system depends on the public-acceptance technique. Party loyalty, church membership, international sympathies and alliances are not determined by the events of a day, nor can they be overthrown in a day. They are the cumulative effect of years of unobtrusive selling of an idea, of unconsciously received propaganda. We would not have declared war on Germany because of the submarine warfare had not the preliminary work of arousing our feelings of animosity toward that country and our feelings of kinship with her enemies been aroused by previous months and years of selected news, some of which may have been true, much of which was undoubtedly manufactured, but all of which was carefully sifted with a view to building up a prejudice for one side and against the other. Before the explosive emotion could be generated, the smoldering feelings had to be aroused, and before that the unconscious sympathies and resentments had to be enlisted and directed. Events proved that the preliminary steps had been well executed. The campaign was effective; but compared to the 1940 model, it was crude, and our wonder in looking back at it is that it worked as well as it did. Today, with radio and newsreel, with syndicated columnists and hundred-thousand-dollar lobbyists, we are subject to a more subtle and more effective bombardment of biased "news" than was ever imagined in the World War period. The fact that many of us do not recognize it as such after twenty years of enlightenment as to the methods employed to the same end in 1914 to 1917 is a tribute to its effectiveness. A gentle pressure, unremitting and long continued, will render the coolest and most logical of us incapable of seeing world issues in the clear light of their intrinsic merits rather than surrounded by mists and fogs arising from the unreasoning feelings with which we regard them.

This recognition of the power of propaganda emphasizes the need for a cautious weighing of the news of the day and for an attempt to discover the source and the possible motive inspiring it. At the same time it arouses us to the possibilities of the same methods and techniques in the immediate affairs of the conduct of our own business enterprises. Three fundamental factors must be taken into consideration in any

corporation, large or small, which plans to continue to do business and to develop as the years go by. First, the success of any such organization depends primarily on the feelings of two groups of people, the buying public and the company's employees. Second, human beings are never neutral. There will be feelings in one direction or the other, favorable or unfavorable. Third, the generation and direction of these feelings cannot be left to chance, to professional agitators, to hostile malcontents, or to competitors. By the very nature of the business, if the company does not consciously and consistently direct and build up the feelings of these two groups, somebody else will and it takes no soothsayer to divine that under these circumstances the feelings will be neither favorable nor friendly. Friendly feelings are like flowers in a garden. They require constant care and supervision, intelligent cultivation and nurture. The feelings of hostility and unfriendliness are weeds that plant themselves; their seeds, coming from no one knows where, are carried by the birds and the winds of competition, of jealousy, of unsatisfied ambition, and of ignorance.

There is no organization, large or small, that does not have some defects which can be magnified and spotlighted to its detriment. Nor is there any such organization that does not have virtues and praiseworthy qualities which through neglect may not be appreciated by its own employees and by the buying public. It is not only the legitimate right of every corporation to ensure the recognition of these virtues by the use of public-acceptance propaganda, it is a common-sense measure of self-preservation, a duty which the company owes to itself and to its employees. Few corporations make the most of their opportunities in this respect. They are so busy selling their product to their customers, that they forget to sell the company to the employees. A company that has virtues, that is so conducted that its employees would be proud to be members of it if they knew all the facts, and that takes pains to make known the facts, need worry little about the buying public. Every concern has a personality, and the public rates it accordingly; and that personality is a composite of the attitude of the workers in that concern toward the concern itself. Most employees, hearing their employer criticized unjustly by outsiders, have not the information with which to refute the statements thrown up to them. This is not the fault of the worker if the employer has not put the ammunition in his hands. No man or woman is so lacking in self-respect that he does not want to be proud of the company in which he works. He should be given the information which makes such pride not only possible but inevitable.

This cannot be done by spasmodic high-pressure campaigns the week before Christmas. It must be the consistent policy of the years built

with steady and intelligent long-range planning and based on sound facts and figures. Most supervisors do this sort of thing as a more or less routine part of their job. An employee comes to them to ask where he stands, what there is ahead for him in the organization; or he comes with an offer from some other company and is debating whether to accept it or to remain where he is. At such times the supervisor presents information which puts a different face on the situation. He tells of others who have left to take up work with other companies and who have come back later to ask for reinstatement, confessing that they did not know when they were well off. Or he explains the advantages of seniority and length of service, of profit-sharing benefits that accumulate with increased years of connection with the company, of sure promotion for those who are willing to do the necessary study to prepare themselves for it, of a dozen other items of advantage of which the employee was in ignorance. The weak part of this system is that only one employee is reached at a time and only after a grievance has arisen. Under such conditions the supervisor is selling the company to the employee, but it is a defensive campaign at best. Still more important is the fact that the supervisor himself frequently does not have the necessary facts with which to answer the objections that are raised. The matter of providing this information has been left to chance, and we know by experience that where chance is the determining factor, only a few supervisors will be well equipped with the facts, that the majority will have only partial information, and that many will be entirely without it.

The remedy obviously lies in planned propaganda, an unobtrusive but effectively continuous policy, year in and year out, of selling the company to the members of the organization at whatever level they may be working. To neglect this is to overlook one of the greatest potential assets any company can possess, the enlightened good will of its working force. After years of such policy the good will of the public follows as a matter of course.

DISCUSSION 5. GRATITUDE

Literature is full of tales whose chief motif is that of "base ingratitude." Shakespeare knew its dramatic possibilities and made the most of them in "King Lear." More surprisingly, he seems also to have known the mechanism which generates, if not actually ensures, it. The daughters, to whom he gave all he had, hounded him to the verge of the madhouse; the one to whom he gave nothing befriended, protected, and loved him to the end.

Gratitude has been called the most uncommon human virtue. Nevertheless, we are taught to expect it and to count on it in our dealings with

others. Its failure to develop as a result of our kindnesses and favors is the source of much anguish and disappointment. The lack of it where we have had most reason to anticipate it comes as a shock like that of a physical blow. "Ingratitude more strong than traitors' arms quite vanquished him" after the traitors' arms had dealt Caesar more than enough dagger thrusts to have vanquished most ordinary mortals. And how often have we heard in our daily lives, "And after all I have done for him, he does this to me"? The expectation of gratitude is based on a lack of understanding of some of our basic human reactions.

To begin with, we must grasp the fact that every person has a fundamental need and craving for a feeling of personal worth. It is true in every race and in every country—and doubly so in this country where, as Bill Nye said, we are trained from childhood to the belief that every man is as good as every other man and a damned sight better. The philosophers glorify it in international relations as "the will to power." The need for the feeling of personal worth is the basis of pride of workmanship, the mainspring of ambition, and the essence of competition. An understanding consideration of it in others is the foundation of tact and of good manners. In a thousand ways we recognize not only its importance but its universality. The books on the art of dealing with people merely ring the changes on this one theme. The orientals, with their customary reverse twist, state it in the negative form when they respect the practice of allowing the other man the chance to "save his face." We go further and recognize that face must not only be saved, it must be enhanced. No man is so humble or so submerged in the struggle for existence that he does not feel to some degree his importance to some people. The roustabout in the small plant shipping room whose sole job was to truck the boxes onto the freight cars expressed it when he boasted that he was the only man in the plant through whose hands had to pass every single item of merchandise which they manufactured. The president feels it when he addresses the board of directors at the annual meeting. We all feel it if we are normal.

Second, we should pause and ask ourselves why we like to do a favor for someone. Is it because of some divinely unselfish motive that was born in us, the "spark that makes us human"? Do we perform an act of self-sacrifice when we go out of our way to do something to help some other person? We do these things so much as a matter of course in the give and take of life that we seldom pause to reflect as to our true motives. It may not be flattering to ourselves to face the truth of the matter, but if that is so, it merely proves the point—we want to feel that we have done something rather magnanimous, something increasing our feeling of personal worth! We make no sacrifice when we help others. We merely increase our own sense of our own importance and

worthiness. Prosaic and unromantic such a view of the matter may be, but not sordid or pessimistic. One must be trained to such ideals of service, and the more thorough the training, the more exalted is the character of the one so trained, the greater the compulsion upon him to act in accordance with his ideals, and the greater his opportunity for feeling an enhanced personal worth when he does so act. When I am in a position to do you a favor, I find myself in a position, for the moment at least, which confers a feeling of superiority. One of the few joys of being a crowned head is that of having the power to grant favors, to bestow honors, to confer rank and to pardon offenders. It signifies power and the possession of power is seal and sign of personal worth.

Now turn the picture around as we do those cartoons that are drawn to show a smiling face when right side up and a weeping one when inverted. To the same degree that it enhances the feeling of personal worth to bestow a favor, it decreases that feeling to receive one. No one likes to be in the position of having to depend on another for the good things of life. It is much more satisfying to me to feel that certain things are mine because I have earned them by my own merit and my own efforts. The pardonable pride of the self-made man who boasts that he fought his way up against odds expresses the low esteem in which he holds success achieved through the favor of others. When we poke fun at such a man by saying, "He is a self-made man and proud of his creator," may not our quip be tinged a little with envy? A person to whom this whole notion is both strange and (therefore) unpalatable will cite in refutation a dozen instances in his own career where he has had favors done him and has been eternally grateful, or where he has done favors for others and earned their undying gratitude. To prove his point, he will tell you how at the very first opportunity the favor has been returned, and with interest. It is one of the pleasant experiences of life when the recipient of some long-forgotten favor turns up unexpectedly to requite the favor with another and a greater one. He calls it gratitude long fostered and only awaiting the opportunity for expression. Perhaps. But perhaps it might equally be seen as not only balancing the account but as turning the tables, all unconsciously of course. David Lamson in a recent short story in the *Saturday Evening Post* tells of a peasant whose life was saved by a neighboring farmer and whose gratitude was so great that from that day on he spent so much time trying to be useful to the farmer that he neglected his own work and finally became somewhat of an annoyance. It was impossible to persuade him that he had already done more than any man could be expected to do in gratitude. It was a debt the peasant felt never could be amply repaid. The farmer finally hit upon the idea of having the

peasant come up just in time to pull the farmer out of the well into which he had apparently fallen by accident. When he explained that the account was now completely balanced the peasant went away rejoicing and the unwanted assistance ceased forthwith. The farmer understood the mechanism of gratitude.

Benjamin Franklin understood the principle that we like those for whom we do things, not those who do things for us, and he made good use of the knowledge. The modern industrialist has unfortunately not always appreciated the significance of the tendency. In an attempt to live up to the new concepts of sweetness and light in the attitude of management toward the employees, he has, with fanfare of trumpets and due publicity, bestowed upon them out of the goodness of his heart and to show his interest in their welfare, clubhouses, golf courses, schools, churches, swimming pools, and Christmas bonuses; and tears of disappointment have coursed down his cheeks at their ingratitude when they have listened to agitators and struck for higher pay, or without agitators have refused to use the facilities presented to them for their free enjoyment. Both of these things have happened too often to be considered unusual, and the events are always cited as examples to prove how useless it is to try to be decent to the workingman. Actually it is no defect in the workingman, but the very human reaction of resenting a situation in which he is forced into the role of recipient of favors, however desirable the gifts might be intrinsically. The effect is cumulative, the more frequently the favor is bestowed, the more irksome becomes the feeling of a loss of personal worth because of it.

This is not to say that nothing should be done to make the lot of the worker more pleasant, nor is it an argument against the erection of clubhouses and the laying out of company golf courses. It is merely a suggestion that when such benefits are proposed, they should be advanced as things done not for the employee, from which no returns are expected, but for the company, for greater profits, for greater efficiency, for, frankly, purely selfish reasons. The company makes it plain that rest periods are inaugurated not out of love for humanity but because everybody benefits by them and nobody loses. The workers feel less fatigue, enjoy their work better, make fewer errors, and do more work in a day. There can be no resentment when the idea is sold on this basis because in it there is no feeling of having received a favor, no question of the relative positions of a receiver and a donor. It does not have to be *accepted*. It is a matter of mutual benefit and it should be so presented if the best results are to be expected. And this applies not only to the rest periods but to the furnishings of the recreation rooms where the rest may be taken and to all the other things which in the common phrase of the day are "done for the help" by a progressive

organization. They are not done for the help. They are done for the company, and, fortunately, this is one place where nothing is gained by not stating the case in its true form.

DISCUSSION 6. WORKER AND CITIZEN

In a recent issue of a well-known management journal, there is an article that presents an old subject in a new way and in a manner that stimulates a reconsideration of two or three factors of plant supervision. In this article the author focuses attention on how different is the status of a man as a citizen of the United States and as a worker in an industry in the United States. He points out that we have had little trouble living with each other as citizens for a hundred and fifty years and not such outstanding success in living with each other as employer and employee. He then points out that the same man has a very different status in the state from what he has in industry. As a citizen he has a large measure of freedom of speech. He can criticize those in authority, and he makes the most of the privilege. He has a voice, through the ballot box, in the selection of those who are to govern him, and he can exert his influence upon them by this power after they are selected. He has a constitution and a definite code of laws which state in no uncertain terms just what he can do and what he must do. And finally, when he is considered to have violated the regulations, he has the right to a hearing in the form of a trial by a jury of his equals.

Consider now his condition in these same respects in industry. Wisdom, gained perhaps by bitter experience, dictates that if he wishes to exercise his right of free speech, it will be good policy to do so where it will not be heard by anyone else, fellow worker or employer, if what he has to say is not complimentary to the management. He has no voice in the matter of who is to be his supervisor nor has he power to change or correct the supervision if he finds it faulty or unjust. He not only has no bill of rights as an employee, he often has no adequate idea as to exactly where his duties and his responsibilities begin and end, nor does he know fully what are his privileges and perquisites. And when he has been suspected of failing to meet the somewhat nebulous rules and regulations of the company, he is faced with the charges by a man who is at the same time his accuser, his prosecutor, his jury, his judge, and his executioner.

When we consider the relationship presented in this way, our wonder is not that we have engendered friction by the method, but that we have done as well with it as we have in a country where the possession of these benefits is one of our proudest boasts and an advantage that we have had pointed out to us from childhood up. The only reason that we have been able to work so long and so satisfactorily under this sys-

tem is that it has been submitted to more or less voluntarily. If it were imposed upon us by law rather than by custom, we would rebel as we did over taxation without representation. It has always been possible, when matters became intolerable, to withdraw from the situation and seek employment under more pleasing conditions. But with ten million workers out of employment for almost a decade, even this mitigating circumstance has largely faded out of the picture. It is for that reason that the situation takes on more importance today than it had twenty years ago. It is for that reason that some of the more farsighted corporations have adopted at least partial measures which may be regarded as steps in the direction of reducing somewhat the discrepancy between the worker and the citizen. A degree of freedom of speech has been offered in the form of the suggestion or complaint box. The various shop committees where grievances may be aired and acted upon are also remedial measures for this difficulty. In a few plants something akin to a constitution is provided in the form of a written policy in which are stated both rights and responsibilities, privileges and duties, in the main factors involved in employment. And in a select few something closely resembling trial by a jury of one's equals has been inaugurated with satisfying results. The movement, slow as it is, is clearly in that direction.

The question interests us as members of the supervisory force of a going corporation mainly as a stimulus to consideration of the trend as it affects the daily execution of our supervisory tasks. There is a momentum to the customs and procedures of a large corporation, and it is well that it is so. On this momentum is based whatever stability there is in the workaday world of industry. No one supervisor and no single small group of supervisors can effect a sudden and revolutionary change of company policy, and no company would long survive where this practice was countenanced. But there are many small decisions to be made daily, many opportunities to select one of many ways to enforce a rule or inaugurate an innovation, in which an understanding of this defect in our industrial setup might indicate action of a different sort from that which would be taken if no consideration were given to it.

Freedom of speech is a safety valve in industry no less than it is in political government. Criticism, constructive or otherwise, can be kept to a sensible minimum by purposefully preaching the doctrine that such criticism is not only permitted but is encouraged and welcomed. An interesting and instructive experiment along this line was tried at the Hawthorne plant of the Western Electric Company. In the course of an extensive investigation as to the effect of rest periods and sundry similar innovations, it was decided, as a side issue, to determine by

interview something of the attitude of the worker to his job and to the company. Not much was expected of the trial, but a corps of supervisors was sent out into the plant to ascertain the plant attitude on certain set questions. From the start it was found that there was resistance to this directed sort of questioning, but as time went on it was found that the employees were willing to talk about subjects of their own choosing. Quickly responding to this cue, the experimenting psychologists altered their line of approach and directed the interviewers to give the workers perfect freedom of choice of topics, merely taking care to show a real interest in whatever subject came to the surface. When the questionnaire method was employed, the interviewers had difficulty in keeping the person interviewed interested for more than fifteen minutes; but when the free-expression plan was well under way, it was found necessary to extend the interview period to an average of an hour and a half. The fact that in the course of more than two years of this experiment about 60 per cent of the criticisms were unfavorable to the company indicates how firmly the factor of confidence had been built up. A great many minor abuses or misunderstandings were uncovered and corrected as might be expected, but the main benefit of the device seems to have been the effect on the workers themselves. A common remark made in the interview was that this was the best thing the company had ever done, that it ought to have been done long ago, and that it ought to be made a permanent institution. In all, over 20,000 employees were interviewed out of a total of about 40,000 on the pay roll. Thus free speech was made a reality, and no cataclysmic disruption of discipline followed in its wake. On the contrary, a general lessening of tension and a betterment of morale all along the line were easily observable.

As to any attempt to parallel in any way the citizen's power to elect those who are to rule over him, little, if anything, can be done at present in industry as it is composed and administered. Any such development is many decades removed even in the opinion of those idealists who think that it will come eventually.

Much may be done in any plant to duplicate the removal of uncertainty as to duties and obligations, rights and privileges, however, by some form of codification of the company policy in terms readily understandable and in a form brief enough so that it would be read. Nothing so formal as a constitution or bill of rights is suggested, but if each new employee were given a small pamphlet explaining what the company has to offer and what they expect in return, many of the fuzzy regions which are now a sort of no man's land would disappear for both supervisor and worker, and many of the discrepancies between different departments or different supervisors in the same department

would be cleared up. What these points are will become quickly apparent as the free-expression interview system develops the technique and art for eliciting them.

An equivalent of the trial by jury, so sadly lacking in the old-time industrial organization, is being provided in many different ways. The right of review of a complaint by an unbiased general personnel department goes a long way toward making the worker feel that he is not at the mercy of one individual where clash of personalities may be the real factor of friction rather than incompetence of either supervisor or worker. In one or two plants recently, actual trial by a committee of workers has been found to straighten out many nasty tangles and to result in less friction and fewer discharges. In such cases it has been found necessary to restrain the trend of such committees toward over-severity, rather than to prevent their being overlenient. The chief virtue of the system seems to be that a man will hesitate to get into a jam with his supervisor if he knows that his quarrel is going to be reviewed more or less impartially by his fellow workers who in general come from other departments and who work under other supervisors.

The purpose of this discussion is not to recommend any one system. Our intent is merely to stimulate thought along these lines. In many organizations employee relations are as smooth as they are because in at least rudimentary form the elements of these devices are in operation, whether as of deliberate design or merely through an evolutionary growth with experience. It is probable, however, that in no plant has their full value been appreciated or their full potentiality developed.

DISCUSSION 7. SETTING A GOAL

The law of inverse squares applies to incentives no less than it does to the intensity of illumination or the attraction of gravity or the pull of a magnet. Illumination 2 feet from a lamp is 4 times as bright as it is 4 feet from the lamp, 9 times as bright as it is 6 feet away, 25 times as great as it is 10 feet from the source. A magnet nearby pulls 100 times as hard as it does 10 times as far away. A goal set a year hence is 12 times as far away as a goal set a month away, and the square of 12 is 144. The goal a month away pulls 144 times as hard as the one a year away. By the same rule, a goal attainable in one day has 900 times the incentive value of that 30 days removed.

One reason why most men do not accomplish more is that their goals are so remote as to have little pulling power. The boy who quits school at the end of the eighth grade to go to work for \$6 a week rather than go on with his schooling does so because the goal of \$6 a week now is more attractive than that of \$16 a week four years later. A penny held close to the eye will hide a dollar held farther off. Offer a child

his choice between a 5 cents today or a quarter a week from now and nine children out of ten will take the immediate five cents. And in some respects "men are but boys grown tall."

The distant goal lacks drawing power because after a reasonably brief period of effort to reach it, we seem to be no nearer its attainment than we were before. It is a matter of proportion. We measure our progress not in terms of absolute units of accomplishment but in terms of the ratio it bears toward the total distance to be traveled. We must have visible accomplishment, otherwise we should lose our incentive and our headway. Set out on a drive from one coast to the other, and observe how inevitably you break up your goal into lesser goals. It is something pleasing to cross another state line, to reach and pass the Mississippi, to register on the odometer the first and the second and the third thousand miles. The main objective may be the other coast, but we cannot wait that long for the thrill of accomplished purpose. The crossing of the river where the East changes to the West is a more real measure of attainment than the sense of having gone three-fifths of the way to our objective. Even more interesting and compelling is the place which we set in the morning as the goal of our day's drive. We drive today not to get that much nearer the end of our journey but to "make South Bend" before nine o'clock.

In psychology laboratories we find that learning is faster when the learner is told at frequent intervals of the progress he is making (see Chap. 10). Knowledge of a gain is an encouragement, knowledge of a loss is a spur to greater effort. In this method one is competing against himself and his previous performance. For some it is an incentive to know what others have done or are doing. For others it is a deterrent, the laggard becoming discouraged and the superior ones becoming too self-satisfied. But competing against one's self has an almost universal appeal. The garden variety of golfer is as pleased to break a hundred as the champion is to break a course record. Golf is the almost universal game that it is because it has this factor of an incentive to beat one's own best previous performance. The distant goal may be eighty, but the immediate goal is one stroke better than ever before.

In the office or in the shop there is customarily condemnation or scorn for the "clock watcher." Nobody is a clock watcher who has anything more interesting to watch. If the only visible change in the environment is that of the position of the hands on the clock, we all become clock watchers. The fault is not with the individual who keeps track of the passing of time but with the task which is so devised that the clock is the only item worth watching. The man on the belt who faces an unending progress of oncoming parts, a line that comes from nowhere and never gets less, whether he works one hour or five,

is compelled to measure his accomplishment by the only thing in his surroundings that has changed—the time of day. This is a defect of the plan of the job, not of the worker. There is no job so repetitive or so continuous that it cannot be made to show a score even if it be only the lighting of a light at each hundredth operation or the ringing of a bell at each thousandth one. Almost any form of visible score lends a false interest to an otherwise dreary task.

This should not be taken as implying in any sense a lack of importance in the distant goal. Ambition is merely the name given to the ability to set up a distant goal and to work constantly toward it. But the more remote the end, the greater the need for dividing the approach to it into steps or markers which must be passed in succession in the process of the advance. We shall be much more likely to reach Denver by Wednesday if we hold ourselves to the immediate task of getting to Omaha for lunch today. Extra money as a bonus at the end of the year is an incentive to better effort, but it is outweighed by some visible evidence that something extra has been earned today. One of the evidences that human beings are superior to the animals is that we crave evidence of accomplishment. If we have clock watchers working for us, it is a sign that we have failed to provide them with such evidence. It is possible for a job to become so interesting that the passing of time is not noticed and the end of the day arrives with unexpected suddenness. And if we ourselves are not urged on to work by a well-conceived plan of advancement or of personal improvement, it is because we have not set up mileposts along the road to the distant goal. If life is to be interesting, the game must have a score.

DISCUSSION 8. GIVE AND TAKE

The art of living is sometimes said to be dependent upon the ability to learn to give and take. In the material sense the words have rather definite meanings. If, in response to the panhandler's mumbled request you give him 10 cents, you have 10 cents less and he has 10 cents more. We use the terms in a figurative or in a psychological sense, however, in describing a transaction in which the decrease or the increase resulting from giving or taking either is nonexistent or has no relation to the total store possessed before and after the exchange.

Consider as random samples in this realm such highly divergent items as "love," "the measles," and "credit." One may give unstintingly of love, loyalty, devotion for a lifetime without diminishing the supply originally possessed. In fact, the trait may feed upon itself and grow by what it feeds upon, like the ambition of a dictator, and by developing with use increase in intensity. You may give without giving away. And, as children, we used to puzzle over how we could "give" our

playmates the measles or a cold in the head and still have it left in undiminished quantity ourselves. We were even told that we might give them a severe case of the ailment although we ourselves had but a light affliction. We would then be in the position of giving more than we had. Obviously, there is more contained in the concept of giving and taking than mere addition and subtraction.

In the world of the certified public accountant the giving and accepting of "credit" is a matter to be indulged in with caution and circumspection. Credits involve debits. What is a credit on your books may be a debit on mine. Too liberal giving of credits may be a precursor of proceedings in bankruptcy. In the field of human relations it is far otherwise. A credit on your books may be an equal credit on mine as well. English is a peculiar language. We lift a word out of its original environment and apply it in a new situation in a somewhat figurative sense, and at first we understand that it is merely a metaphorical use; but with long use it takes on the color of its new surroundings, and with the change it assumes a new meaning. But when the word is still retained for use in its original setting and in its original meaning at the same time that it is undergoing changes in the new use, it may involve us in a confusion of concepts which affects our response to the word in both its meanings. We are likely to carry over some of the old meaning into the new situation. "Credit" suffers from this defect.

It is to my credit if I invent newer and better ways of doing things, devise simpler and more efficient methods of procedure. If my record shows many such creditable items, my chances for more remuneration or for promotion are enhanced. Hence, I become jealous of anyone who is attaining greater credit with my superiors. I am alert to claim credit wherever possible, and sometimes I confuse the commercial meaning with the social meaning and develop the mistaken notion that if I "give credit" to another, I am in some way debiting my own account by a like amount, or at the least failing to add to its credit. A subordinate makes a suggestion which I instantly recognize as excellent. I wonder why it has never been made before. I wonder why I never thought of it myself. I know it will be welcomed by my superiors. It is a creditable suggestion. To propose it will reflect credit upon me. It is expecting a good deal of me to ask me to forego this opportunity to add another item to the credit side of my record with the company. Why should I enhance the reputation of another when I have the chance to increase my own? I will report it as my own idea and add to my prestige as I have every right to do since I am responsible for all that goes on under my supervision. The psychology of justification is as interesting as it is insidious. And it is just at this point that the old meaning of the word insinuates itself into the picture. Under its influence one may act as though credit in this sense has to do with some-

thing that is of definite and fixed amount and limited quantity. What somebody else gets I must of necessity lose or fail to get.

Ignorance, it is said, is no excuse in the eyes of the law, and it is as true in the law that governs the gaining and the giving of credit as it is in the statutes of government. The truth of the matter is that the law of assigning credit is unique in that it states that the more we attempt to pass credit on to others, the more adheres to ourselves. The more assiduously one tries to impress upon his superiors that the credit for a new idea belongs wholly and entirely to some man in the ranks of his department and not at all to himself, the greater is the portion of it which will be written into his own record. Loyalty or the measles can be given without reducing the original supply, but at least one has to have them before they can be bestowed on others. Credit is unique in that it can be acquired where none previously existed by the simple process of attempting to give it to someone else. It is one of the few things in life that we can give to others without first possessing ourselves; and yet in the end we have as much for ourselves as we gave away.

Under such circumstances it is difficult to understand why anyone should steal credit from another, yet it is one of the frequent sources of annoyance to workers and one of the common causes of disgruntlement and dissatisfaction with supervisors on the part of those working for them. A man who has had the experience of proposing to his immediate superior a clever idea which was turned down as something valueless only to be taken up and adopted some weeks later as the idea of the man who turned it down is not likely to propose another idea in the future. Credit can be stolen, but the credit-grabbing boss dries up the stream at its source, for the man who has been double-crossed does not keep his dissatisfaction to himself. After a few such happenings in a department, the supervisor will have to depend upon his own ability to originate ideas. He will get none from his workers.

Actually, while credit can be passed on to those below us, the process of passing credit generates its double which remains with us. The supervisor who, when the big boss comes through the department, takes him over to the man at the bench and says, "This is the man who had that bright idea for saving wrapping expense last month," pleases both the man and the boss and encourages every man and woman in the department to try for similar recognition. Such a department becomes known for being progressive, and the supervisor gets the credit for the improvement. Such being the case, we can think of no excuse whatever for the pernicious habit of credit grabbing—except one—ignorance.

POSTSCRIPT: The credit for having suggested this topic for discussion goes to Mr. F. Nagle of the purchasing department of Sears Roebuck and Co.

DISCUSSION 9. DOING TWO THINGS AT ONCE

One of the things to look for in a man or woman, if you are thinking of hiring or promoting or entrusting the person with special responsibilities, is that peculiarly vacant expression of the eye which tells you that the person is thinking of something other than what you are saying. It is a faraway look focused on nothing. It is the infallible sign of the person who thinks he has learned to "do two things at once."

The chances are that the habit was acquired in childhood when admiring parents thought it was a sign of especial cleverness that the child could read and listen to conversation going on about him at the same time. It may be picked up later in life, however, by one who escaped the misfortune in early life. One good way is to drive through traffic while listening to a baseball broadcast on the car radio. However it is acquired it is one of life's most expensive habits.

The only activities which can be carried on simultaneously without serious detriment to one or both performances are those which use entirely different nerve and muscle systems, different sections of the brain switchboard. Thus, one may walk along an unfrequented lane and work out a mathematical problem or rehearse a speech. Different systems are used, and there is no interference between them. In addition, the walking has become "automatic" in the sense that no special attention has to be directed to the separate movements of the limbs involved in the process. Even so, if the thinking process being carried on is one requiring close concentration, one is apt to walk less well and with less purpose, to stumble or take wrong turns or to fail to observe familiar landmarks and so lose one's way. Attention is a peculiar function. Like the union, it is one and indivisible. The ability to keep it under one's command is a priceless acquisition.

William James explained some of the factors of attention by supposing it to have a "focus" and a "margin." The person walking down the lane has his problem in the focus of his attention. The trees, houses, and people he passes are in the marginal regions. Later, he will have a hazy notion that he passed you without being fully aware of it at the time. While reading a book in the living room, a car may drive up and the driver sound his horn without our hearing it, yet when he blows it again we become aware that it is not the first time it has sounded. These things in the marginal region are distractions from the main activity only in proportion to the amount of attention we turn upon them. One definition of attention is "The turning of the receiving mechanisms toward the source of the stimulus in order to receive more of it." Distractions are always lurking in the environment, even though we lock ourselves in a soundproof room with constant tem-

perature and steady illumination. The very strangeness of the situation may become a distraction. Distractions may arise within our own bodies. The efficient worker is the one who has learned to prevent marginal stimulation from becoming focal. It is a habit that has to be learned. No one is born with it. Because the infant is easily distractible, one of the best and easiest methods of managing him is to bring some desirable stimulus strongly into the margin so as to displace the undesirable stimulus in the focus. That some of us never outgrow this easy distractibility is well known to the salesman and the politician who use it to divert us from focusing our attention on things they would prefer not to have scrutinized.

If you have ever read along in a book only to wake up suddenly to the realization that you have not sensed anything that you have been reading for the last two or three pages and have had to turn back and retrace your reading to find where you "went off the track," you have experienced distractibility. If you are a careful observer, you can find the word or the phrase which shunted the train of your thought off onto the siding. Something connected with your past experience was suggested by the words, and you switched off from the thought of the author onto those of your own which followed up the suggestion. Your eyes automatically go on following the lines, and your hands automatically turn the page, but you are thinking not of the words of the book but of how you are going to meet the next payment on your insurance policy, because somewhere in the material you have been reading the author used the word "premium." That is distractibility.

If you have ever engaged in a conversation, social or business, or listened to a lecture and found yourself wandering off on a side trip of your own while the sounds of the speaker's voice continue to impinge unheeded on your ear, you have experienced distractibility. You have experienced it if you have sat down to think out a problem and found yourself planning a canoe trip in the North Woods instead.

In either of these cases if someone else were observing you and the expression in your eyes, he would have been able to call the moment when you disconnected from the focal matter and took up with the side issue. A singularly vacant expression takes the place of the alertness that was there the moment before. And when this practice of following distractions off into the realm of daydreams becomes habitual, the vacant expression does also. If you are talking to a person and notice the onset of this faraway look in the eyes, you may as well stop talking. He is physically before you, but mentally he is elsewhere. In fact, complete cessation of the sound of your voice often recalls him and you are again the object in the focus of his attention so that you can talk to him again.

The obvious reason why this is a most expensive habit is that one who is a victim of it only half reads and only half hears. He does not make what he is reading a part of his mass of learning, a part of himself. He does not hear all the points of the directions that are being given to him. The less obvious disadvantage is the effect it has on others. It is anything but flattering to our sense of personal worth to have the person we are talking to apparently lose interest in what we are saying. We rate a person who has this habitual faraway look in his eye as less intelligent than he really is. It may be because of his rich past experience, because what we say may suggest many more things to him than it would to one of less intelligence, that he is more liable to go off on these side trips than a more stupid man would be. It is not a matter of intelligence. It is a matter of habit. If you give me your eager and undivided attention and keep me in the focus of your attention while I am talking to you, I am flattered, and, being normal, I rate you as a person of extraordinary intelligence, one who appreciates the words of wisdom I am purveying.

How can the habit be cultivated? By making it a practice to keep the attention under control, to know what you are thinking about while you are thinking about it. It is not a habit one can take on and discard at will. It is a way of living. One must observe it in the small affairs of life if one is not to suffer from it in the larger enterprises. If we sit of an evening and read the editorials while "listening" to the radio, we may expect to hear in the office the next day only a part of what is being told us about the work of the day by our superiors and our subordinates. And even while we were reading and listening at the same time, we were doing neither so well as we would have done either activity alone.

"Dividing the attention" is an expensive habit—and anyway it is impossible.

DISCUSSION 10. HOW OBJECTIVE ARE YOU?

Saith the poet, "Give me the man who sings at his work." Says Bill Nye, "You can have him. Nobody else wants him." And Mark Twain comments, "It is a good thing all men do not think alike—difference of opinion is what makes horse races." It also makes for social stability. One man falls in love with a girl and marries her, and his best friend says, "What he can see in that girl is more than I can imagine."

Why do we not all think alike? To put it still more strongly, why do not any two of us think exactly alike? In matters of religion, politics, morals, rights, obligations, we may get agreement in general terms, but as to details we are sure to encounter diversity of opinion. Democ-

racies can exist only in those lands where the art of compromise in nonessential matters has been learned. What is the source of these differences, and what is their importance in industrial relations?

Henry Ford, decrying the trend toward the use of tests in industry, is reported to have said that he can tell more about a man from a ten-minute conversation with him than can be learned by any amount of psychological testing. He may be right. We have no way of knowing whether he possesses the psychic sense that the mystics would have us believe can be cultivated by spending twelve years in the high Himalayas under the tutelage of the lamas. They tell us that they can see each man surrounded by his "aura," an enveloping, but to the untrained eye invisible, mist of a form and color corresponding to his character and his thoughts. Around the mean and criminal is a shroud of black emanations, even though he be smiling and telling us of his own unsullied nobility. Around the kind and generous is a halo of rose and lavender. We have met theosophists who maintained that they had the power to see these revealing auras. They did not tell us what they saw around us at the time they were telling of their powers, but if scepticism rates an aura of crimson, they should have seen red. Perhaps Mr. Ford possesses this occult faculty. If not, he makes his judgments of other people just the way we do—from the accumulation of past experience. He is not a young man. During his rather extended life span he has met many people and has had occasion to observe how they behave in various situations and under various circumstances. As a result of his experience he has learned to generalize, and he has reduced his generalizations to a rule-of-thumb method of judgment. That it is a fairly good system is evidenced by Mr. Ford's success in life. Perhaps he is more adept at it than the rest of us. If so, he is fortunate. His batting average would be higher than ours, although that is not a very high tribute to its efficacy. Nor does his reliance on his own method at all indicate that there may not be a superior system which may yield even better and more reliable results.

What is the weakness of the Ford man-to-man judgment? Obviously, it is that there are two personalities involved in every such evaluation, that of the judge and that of the judged. And personalities are the product of individual experience. Since no two of us have had the same experiences in life, no two of us have the same personalities, and so no two of us will make the same judgments except by chance and that rarely. If there is an aura surrounding the other fellow, there is one surrounding us as well, and we see his aura only through our own. You and I will bet on different horses if your past experience has caused you to believe that the horse with a barrel chest usually wins, whereas I believe that the power of a racer is in the upper muscles of the hind legs.

So I would employ a man who says, "Yes, sir" and "No, sir," and you would turn him down for the same reason. The man is the same man; it is you and I that differ. Each of us is the product of his past which dates from earliest infancy, and neither of us can dissociate himself from that past. It colors our decisions at all times and influences our judgments.

On the face of it, if this be true, a system which is influenced by the chance happenings of a lifetime is no system at all. The only reason the method has attained to such respectability as it has is that there has never been, until recently, any sort of scientific checkup of its reliability. Like all superstitions, it thrives on the neglect of negative instances. We note its successes and ignore its failures. The employment agent never checks up on the careers of those he rejects. If he rejected the best man who ever applied to him, he would have no way of knowing it. Combined with this is the fact that most men not absolutely beyond consideration by reason of easily observable defects will make good to some degree if given a chance. After all, the universal draft produced a fairly respectable American Expeditionary Force to send to France after the imbeciles and the cripples had been weeded out. The same device would probably lead to the hiring of a working force in any large corporation scarcely distinguishable from that hired by the usual methods of personal selection. If exactly the same men had been picked man by man by General Pershing, he would have been justified in bragging that he was a good picker of men and could tell a soldier on sight as a result of his long experience in the army. We have met a man who maintained he could tell a tinsmith as soon as he applied for a job. He proved his point by declaring that in thirty years he had not made a half dozen misjudgments. He neglected to mention that the job of tinsmithing which he required of them was so simple that almost any man in possession of normal eyesight and muscular coordination could handle it. He was not picking tinsmiths. He was picking men who made a favorable impression on him because of factors of which he was entirely unconscious.

Most men who advocate hiring entirely by interview will tell you that long experience has enabled them to ignore their own personal likes and dislikes and to make a judgment on wholly objective grounds. Setting aside the fact that it is not much of a recommendation of a system to state that it works satisfactorily when the basis of its very operation is disregarded, it is a contradiction of terms to say that experience enables one to disregard the effects of experience. Since the advocates of the method maintain that the "experienced" judge can make objective judgments, they admit their dependence on happenings which cannot be the same for any two men, on results for which

there has been only the most elementary checkup, and on a success which has never been scientifically compared with methods using different means.

And, in conclusion, let us say that we do not have in mind a system to be available or to be recommended within the next decade or two which will render entirely unnecessary or undesirable the fifteen-minute interview of all applicants by members of the personnel department.

DISCUSSION 11. TESTS ARE OBJECTIVE

(See Chaps. 5 and 6.)

In the preceding discussion we called attention to the highly subjective nature of personal judgments, how they are, of necessity, influenced by an interplay of the two personalities involved and how, since both personalities are the product of the past experience of both, there can be no assurance that estimating character by interview will ever have either validity or reliability. Since writing this, there has appeared in the current number of the *Journal of Consulting Psychology* a review of an investigation by English psychologists of the value of the interview when conducted by experienced agents. The conclusions arrived at indicate that although occasionally an interview may yield an estimate superior to that obtainable by test, in general it is found to be impossible to prevent the warping effect of bias and prejudice. In some of the experiments the bias was intentionally made clear in advance of the interview, and in others it was entirely unconscious. In the former case, it was found impossible to compensate justly for the bias, the tendency being to yield to it in an attempt to avoid overcompensation. In the cases where the bias was not suspected, the judgment was largely affected by it and rendered in the direction of the bias and away from the true facts of the case. Nevertheless, it is freely admitted that the interview still has the important function of establishing friendly relations and of getting and imparting some information. This report comes as interesting confirmation of conclusions reached by similar research in this country and is not less significant in view of the supposedly more phlegmatic temperament of fog-bound Londoners. Bias and prejudice are matters springing from the emotions.

The substitution of test techniques for personal contact evaluations has in its favor the elimination of the emotional factors of one of the two parties at interest. However, the emotional factors of the applicant still enter the equation, and it is proper that they should. Tests are frequently criticized on the grounds that some people become so emotional when called upon to undergo a formal examination of this sort that they fail to do themselves justice. To some slight degree this

is true, but it is also true of all school and college "finals" where a great deal depends on doing well in a single test. In college this may be hard to justify, but in industry it is one of the things we should wish to know about an employee or a candidate for employment. In general, moreover, it is less commonly true than it is reported to be. It is more often an "alibi" than a reason for poor performance. And the person who "blows up" in a test session would be likely also to lose a like amount of effectiveness in any emergency that might arise in his work.

The customarily low regard in which tests are held by industrial management is due to one of two factors: unfamiliarity with the methods of test construction or unfortunate experience with alleged tests constructed by persons without the knowledge and training necessary to calibrate and evaluate the test in actual working conditions. No test that has not been subjected to exhaustive statistical treatment is worthy of the name, but unfortunately many such have been foisted upon managements that have had to learn by hard experience that there is no virtue in them and that their use is both misleading and disruptive of organization and morale. It is also true that a test which has worked excellently for ten years in one corporation may have no value for another. Much distrust of tests has been engendered by overlooking the fact that the test has value under certain conditions precisely and solely because it has been constructed to meet those conditions. The very factors which make it serviceable in one organization may make it worse than useless in another.

It should be stated at the outset that no test can be constructed in a situation where there is no measure of success by which to compare and at least roughly rank those who are performing the task for which the test is to be constructed. If you cannot say with assurance that one man who has been on the job ten years is a better buyer than another who has been at it an equal length of time, if you cannot rate experienced men as fair, average, good, and excellent, it is obviously impossible to devise a test that would have any value in selecting a candidate for such a job. In other words you cannot know whether your test has picked a good man unless you can recognize a good man after he has been picked. On the other hand, if differences of ability are recognizable on the job, it is probable that a test can be made to ascertain in advance whether a person "has what it takes" to make a success of the work. One man succeeds and another fails because one has certain traits not possessed by the other. It is the office of the test to set up a situation which will bring these traits into play experimentally. We may not know what the traits are—in fact, we seldom know, nor do we care. All we are concerned with is to find a battery of tests in which the successful men will make different scores from the unsuccessful.

In approaching the problem of constructing a test to meet any given situation, we do so without any opinions on the subject of what will be valuable items to include in the battery. At this stage of the process we are prepared to consider anything anyone suggests as having a possible bearing on the subject. We do not yet know whether the significant items which distinguish the good from the poor performer will lie in the physical traits or in the mental, emotional, intellectual, temperamental, religious, racial, or moral ones. We try them all. Most of them we find have no bearing on the question, successes and failures respond alike to them. They are dependent upon traits which do not enter into success on the job, and they are discarded. The statistical correlation between success on the job and success in answering the question is zero. If our preliminary investigation has been on broad enough lines, we shall find some items, however, which the excellent employee will respond to in a different way from that of the unsuccessful one. That is all we are looking for. We are justified in assuming that any such item in some way measures to some degree one of the many traits entering into success on the job. The more such items we can find which tap different traits, the more value our test will have. Thus the test is not a matter of opinion. The responses either correlate with success or they do not. If they do, we have a test. If they do not, we have none. The matter is determined statistically and not by personal judgment. Thus we say that no test has value until it has been proved by those who alone can furnish the proof—present incumbents of the job who have been at it long enough to establish records of success and failure. The test has first to be tested. Really all we are doing is saying, "Our successful employees meet this test one way and our unsuccessful ones meet it another way. If you meet it the way our successful ones do, we assume you have whatever it is that makes the difference." We may never know what the traits are that make the difference, nor do we care. Call them traits *X*, *Y*, and *Z*. If they make for success and are essential to it, all we want to know is whether you have traits *X*, *Y*, and *Z*. Our task then is to find a test the response to which will indicate whether the applicant has or has not *X*, *Y*, and *Z*, whatever they may be.

Obviously, no test is going to locate all the traits that go toward the making of success; hence, no test will ever be 100 per cent accurate in forecasting. Neither is the method of hiring and promoting without tests ever 100 per cent correct. The test technique has the advantage that the statistical evaluation will show whether it is better than the old method and by how much, and just how many times in a hundred it will be wrong.

DISCUSSION 12. THE COMMON TOUCH

Not the common "touch" which says, "Brother, can you spare a dime," but that fleeting impromptu contact which the philosophical poet might have had in mind when he said, "One touch of Nature makes the whole world kin." Is it an "alibi" when a man says, "I never mix business and friendship"? Is it true that to be impartial, one must be eternally impersonal? Or is it true that the day of the "soulless corporation" has passed into history as a phase of growth through which we had to go in order to arrive at an understanding that personal relations are as important in 1940 as they were in 1740 or 1840?

Does supervision necessarily involve aloofness? And does the manager have to surround himself with an impenetrable shell of superior dignity? The answer to all of these questions is "It depends on the man." It takes a bigger man and a more able one to be friendly and "human" without encouraging the familiarity that breeds contempt than it does to fence off approachability with a wall of cold and repelling austerity. The man who assumes the latter attitude is probably unconscious of the fact that he is afraid to let anyone penetrate his defenses because he fears that the intruder will find out how small is the advantage he really holds. It is a confession of lack of confidence in one's own right and title to respect if one is forced, in order to maintain that respect, to resort to the device of preventing any near-by view of the qualities in himself on which such respect must rest.

We are not suggesting that the manager should go about like a perennial club member slapping all his subordinates on the back as a part of each day's routine, or that he should invite them to Sunday dinner or to come over for the evening to play bridge or pinochle. These familiarities can be indulged in only when the department is small and when they are dealt out to all members with complete impartiality and uniformity. Such a relationship is possible, but it is seldom either practicable or desirable. Some men can do this, and some do it without sacrifice of standing or efficiency, even with a gain in good will which makes their work more pleasant and all their workers glad to be under such a man. Most of us cannot do this, and more of us do not desire to. What we refer to is the interchange that takes place in the daily contacts during working hours at the plant. The man who has no fear that some pretense will be punctured should he unbend a bit in the presence of his inferiors neither avoids nor seeks opportunities for friendly familiarity; he neither repels nor condescends. He accepts the contacts as they come, from time to time, unpredictably, naturally, and as a matter of course. At such times he speaks to the worker in the worker's own language and without any appearance of stooping to accomplish the

result. The manager who knows as little about firing boilers as he does about the chemical composition of sulfanilamide can ask Tony, "How are they going? Got much of a load on 'em today?" and can look into the firebox through one of the peepholes and say, "Boy, that's burnin' 'em up, aint it?" If he then frankly displays some ignorance by asking for an explanation of some gadget or asks Tony how he knows number 5 is not carrying its share of the load, Tony is flattered without knowing why; and when the big boss has gone his way, Tony will say to the engineer in charge, "The big boss he's a good guy." He may pass through the boiler room once a week for the next six months and give Tony no more than a perfunctory "Hello"; still Tony feels a bit better about the job and about the company he works for. Time lost in working the change—maybe ten minutes. And on such insignificant events morale is built.

The supervisor who is closer to his men, directing them day by day and hour by hour under pressure of maintaining schedules, who says that he has no time for idle chitchat or a prying interest in the affairs of his workers, needs to be told that it does not take time—it saves time. A minute spent here and there irregularly, spontaneously, showing interest in the worker not as a worker but as a fellow human being, is a minute invested in better feeling, better will to work, and these are things that cannot be bought with money. Morale is, like Rome, not built in a day. It is built of as many minute particles as a fine mosaic on the walls of a cathedral, and with as much art. The components of the picture are the feelings of the individuals who make up the group. These feelings are as various as the stones of the mosaic which differ in color, shape, and texture. No single instance is important in itself, nor is any single chip in the mosaic, yet taken together they may show the handiwork of a genius.

It is the little things that count.

POSTSCRIPT: Suggested by Mr. Grieve of Sears Roebuck and Co.

DISCUSSION 13. "POST HOC, ERGO PROPTER HOC"

One of the seven deadly sins in logic, in psychology—and in business. *Post hoc* means "after this"; *ergo* means "therefore"; and *propter hoc* means "because of this." *Post hoc ergo propter hoc*, then, means "After this therefore because of this." It is the ancient warning against the hasty conclusion that because one thing follows another it is caused by it. If I sell three shares of United States Steel on a rising market, and if next day the stock market goes into a tailspin I am not likely to conclude that my sale was the cause of the slump. But how about the "Hoover depression"? Because the depression

followed the Hoover administration, are we justified in saying that one caused the other? On this sort of error many a reputation has been made and many another has been lost. A new personnel officer takes over the job in an old company and labor troubles break out that shut down the plant, and the personnel manager loses his job. Yet the cause probably lay in the shortcomings of the management months or even years before the new officer took hold. A new sales manager gets an increase in salary because, within six months of his assuming control of sales, orders which had previously been falling off suddenly show an increase of 20 per cent. Perhaps some conditions outside the plant and entirely beyond his control changed the whole situation, and he was the fortunate incumbent at the time and reaps the credit. It is lazy thinking that attributes causal relation to a mere time sequence.

The Western Electric Company initiated a rest period of ten minutes in the morning and supplied a light snack to the employees by way of refreshment and a rest period in the afternoon without refreshment; there followed a notable increase in production whether measured by the hour or by the week. Naturally, they assumed that the innovation was the cause of the greater output. But when they went back to the old schedule without either rest periods or food another increase resulted. Their erroneous conclusions were a classic example of assuming that one was the result of the other merely because it followed the change that had been made. The difference between success and failure in the conduct of business by a manager often turns on this ability to isolate the true cause and to avoid being misled by a chance sequence.

When the padres established their chain of missions from San Diego to San Francisco in the 1700's they found that it was almost impossible to keep the necessary priests in residence in some sections because of the fatal ravages of malaria. They heard from travelers that the eucalyptus tree of Australia generated a beneficial oil which had the property of curing old cases and preventing the incidence of new ones. Young trees were imported and planted and they thrived mightily and as they grew malaria decreased in severity and in frequency. And so in 1940 your physician includes among his available drugs the old standby, eucalyptol. If it cured malaria a hundred and fifty years ago, it must still have virtues and potency. A splendid example of the *post hoc, ergo propter hoc* fallacy. Malaria, as we now know, is transmitted by mosquitoes. Mosquitoes breed in marshes. Eucalyptus trees are tremendous drinkers of water. It is against the law in California to plant a eucalyptus tree within forty feet of a neighbor's orchard because the eucalyptus will drain the soil of moisture for at least that distance around it and so deprive the fruit trees of their share of it. The trees drained the swamps. The mosquitoes perished for lack of breeding

grounds, and the malaria disappeared. The aromatic oil is pleasant to smell, and the aroma pervades the eucalyptus grove, but it does not cure malaria.

On the other hand, just because we can pick out several instances where a prior event was not the true cause of a subsequent one, it does not follow that this is usually the case. We are merely suggesting caution and inviting analytical second thought in many of those daily sequences that occur so often that a causal relation is assumed without much examination. Or, as we used to say when I was in high school, "You can't most generally always sometimes tell—maybe little Willie DID go to Heaven." Unquestioned conclusions may be right, but they are as likely to be wrong.

In the present development of our education program there is almost as large a percentage of our young men graduating from college as graduated from high school sixty years ago. It is assumed by the young men, by their parents, and by employers that college education does something to the individual who acquires it which makes him or her superior in many ways and better able to render a good account of himself in the life struggle for success and happiness. There is a general drift toward the belief that the college graduate has during the four years spent in academic pursuits gained something that makes him more valuable as an employee than is the man or woman who abandoned his formal schooling career with the conclusion of his grammar school or high school course. Advocates of this idea point to the percentage of college men who attain to mention in "Who's Who" or who arrive at positions of responsibility in the business world and get their names printed in the list of the high-income taxpayers of the country. The figures are conclusive. The percentage of such successes is far above the percentage of the total population who go to college, hence the conclusion is easy that it is the college education that makes the difference.

But, are we not in danger here of falling a victim to the *post hoc* fallacy? We should not overlook the fact that the very mechanism of college itself acts as a highly selective filter. Automatically it selects those who come from homes in such a financial condition that college can be afforded, or those in which the immediate earning capacity of the younger generation need not be called on to maintain the home. By its mental tests, the so-called "college-aptitude tests" and the entrance examinations, as well as the insistence on excellent performance in preparatory school courses, it further selects those in the upper levels of intelligence. With such a select group we should be justified in expecting superior performance even if college taught them nothing. In fact, they would still be superior even if college somewhat dimmed their native luster. We are not here expressing any opinion as to the

advantages of spending four years in college compared with spending the same four years in gainful employment. We do, however, wish to enter a plea for a more objective evaluation of the merits of any given individual regardless of whether he has been to college. We are in danger of assuming that it is the four years in college which makes the difference. Many a man who could have passed the entrance tests with credit and graduated with honors was prevented from going to college by circumstances beyond his control; today, he may be superior to the man who got into college by the skin of his teeth and made the credits necessary for a diploma without being materially improved in the process. So long as we surround the college diploma with a halo and transfer its glory to its holder, we are in danger of working an injustice on many a good man who has acquired as good an education without the benefit of professors.

DISCUSSION 14. TYPES AND RATINGS

"Type psychology" is not in good repute in this country. Abroad and in former days here, it was the fashion to divide mankind into types and classify them accordingly. William James said that all men are either "tough-minded" or "tender-minded." Freud's follower Jung attempted to divide the world into the introverts and the extraverts. The psychologists of this country are known abroad as "partizan advocates of the psychology of individual differences." We are interested not so much in finding outstanding examples of a given trait, such as introversion, but in a study of how such a trait is distributed among the population as a whole. If we investigate from this point of view, we do not find that there is any sharp dividing line between one "type" and its opposite. James would say that if you are not tender-minded, you must be tough-minded. Jung believed that people were characteristically either in-turned or out-turned, although later he salved his scientific conscience by admitting that he had found some who were halfway between whom he designated as a third type, ambiverts, signifying that they turned both ways.

It is evident to us that what these pioneers dealt with in their types were merely the extremes of a normal distribution of the trait from maximum domination of a trait at one end of the scale through imperceptible differences to maximum domination of the opposite trait at the other end. White and black are undoubtedly different, and so is the person who is predominantly introvert different from the one who is predominantly extravert. Snow is white and soot is black. Substances whiter than snow or blacker than lampblack can be found. Hence, snow is white with a little black in it, and soot is black with a

little white in it. Snow in Philadelphia is not so white as it is in the Arctic Circle, though it is whiter than snow in Pittsburgh. Actually from snow to lampblack we are merely dealing with a continuous series of grays. As the white becomes less white and more gray and the gray becomes darker gray until it resembles the color of lampblack, there is no point where one can say the color ceases to be white and becomes definitely gray or changes from dark gray to black. White and black are the extremes of the gray series just as extraverts and introverts are the extremes of an unbroken series measured on the scale of those traits. And the "ambiverts," far from being a small group of exceptions, are actually the main body of the group. If we divide the introvert-extravert scale into three equal parts two-thirds of the people will be found in the middle third of the scale grouped about the average. One per cent of the people will be found at the outer edge of each of the two other thirds. These relatively rare extreme cases are the "extraverts" and "introverts" of Jung. Being mainly interested in remedial work among pathological people, he was naturally in a position to observe mainly those people who were in difficulties because of the very fact that they were extremes. The majority of people are "normal," and normal means only that they are close to the average.

Since this is true of any trait that we choose to examine, it is clear that there is little scientific justification for regarding mankind as being divided into "types" on any basis. For purposes of conversational description, it is convenient to cast scientific reservations aside and to talk in the terms which the layman has accepted and thinks he understands. It does mean something to say that one man is the "absent-minded-professor type" and another is the "hillbilly type," that one woman is the "giggling-gusher type" and another is the "cold-fish thinking-machine type." It is picturesque and descriptive, but as employers or personnel officers we should make any such generalization with the full understanding that in these particulars these people are merely examples of an extreme development of certain traits that all other people possess in varying degrees. There is much danger of misjudgment if one adopts the habit of thinking that all people can be pigeonholed according to predetermined types. That is an oversimplification which the complexities of human nature render unprofitable if not impossible. Because one man possesses trait *A* to an extreme degree and also displays a goodly amount of traits *B*, *C*, and *D*, it does not by any means follow that the next man we find showing a high degree of trait *A* will also be strong in the three others. Traits do not develop in constellations in this simple manner. If they did, it would be easier to predict how men would behave in many situations where now they surprise us by their unpredictability.

For this reason we should be chary of placing confidence in such generalities as "promotable," "good worker," or "satisfactory employee." Opinions of this sort are no more than the expression of the total effect their personality makes on us in the biased view of our own personalities. It is for this reason that many institutions resort to the use of rating scales in which an honest attempt is made to assay each of several traits separately. "Does he show ability to start a job that he is assigned to without having to be nursed along?" "Does he keep at work under his own steam or does he have to be prodded frequently?" If we are to make any worth-while judgment of the candidate in these details we should be able to rate him in these respects as excellent, good, average, fair, or poor. If we have such a five-point scale rating separately made on a dozen or a score of important traits, we have something of a picture of the capabilities of the individual. No one is excellent in all traits, nor is excellence in all traits required for a high-grade performance of our jobs. But certain jobs call for certain excellences, and other jobs do not require those virtues but demand others. If the only rating we have of an employee is that he is "good," we have nothing by which to determine whether he could fill a better or a different job. The traits which make him good in one job might well actually make him unfit for another. Thus, unimaginative subservience might entitle him to a high rating as a tractable follower of routine operations and yet disqualify him for a job requiring ingenuity or leadership.

If we had such a detailed analytical rating of each employee and knew what traits each job demanded, we should have better success in matching up the job and the person who is being considered to fill it. Since human traits are distributed amongst us according to the normal distribution described at the beginning of this discussion, it stands to reason that in a group of a thousand or more employees, the desirable combination for any given job can probably be found without going outside the organization. Nothing is more discouraging to an ambitious employee than to know that an outsider has been brought in to fill the job above him when he knows that equal talent lies undiscovered within the organization itself. Whether he thinks the talent lies in himself or in one of his fellow workers, the net result is the same—the development of a "What's the use" attitude. We covered this feature in some detail in Discussion 2 of this series under the head of Creative Supervision. We are here pointing out one of the many ways in which this sort of constructive foremanship can be accomplished.

Obviously, if such detailed ratings can be made of any given individual by more than one observer, and if the ratings are averaged, a more exact picture will be obtained than any one judge can make alone, however fair and unbiased he may try to be. Older employees would

automatically accumulate such multiple ratings in the course of service as they shifted jobs or as they came under different supervisors in the course of the natural changes in any organization. Even though such ratings are not required by the management, each supervisor would find them of sufficient value as part of his own records to warrant the effort necessary to compile them for his own files. Revision of the ratings from time to time by means of semiannual interviews would be profitable. Each new rating should be made without reference to past ratings. If the new rating differs from the old one, correction should be made by averaging the new and the old and keeping this average on file as the revised rating. Only by some such continuously reviewed rating system can one be sure not to overlook deserving material when promotions are to be made. If copies of such ratings are on file in the main office or in the personnel department promotion material for an opening in one department may be found in another which would otherwise be completely overlooked.

There is the further virtue in the rating system that in certain cases the supervisor can show the ambitious candidate that what stands in his way of immediate advancement or of future consideration is his lack of certain definite traits, defects which, with proper attention and incentive, he might readily eradicate by consistent and intelligent effort. Personalities, it must be remembered, are largely of our own making.

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